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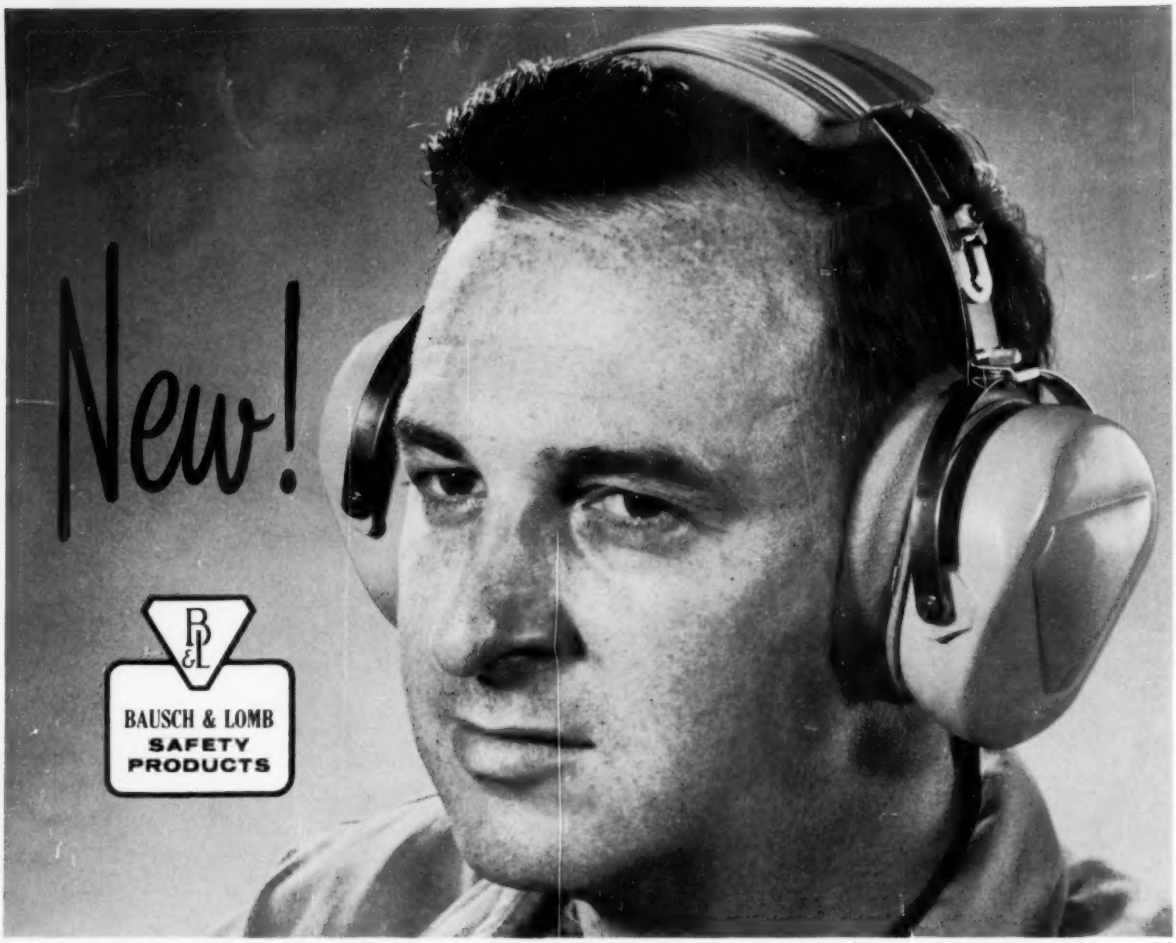

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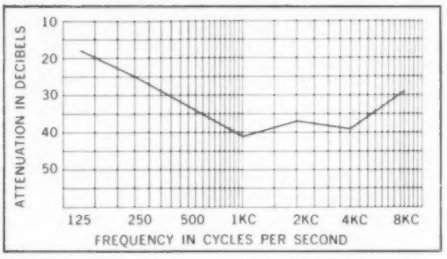

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Safety Maintenance

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Cover picture by courtesy of Standard Oil Co. of California: Hard hat protects oil driller.

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it's SAFE to say

● DO WE FORGET THE OTHER HALF?

With stepped up production schedules and many industries working in high gear, it is reasonable to suppose that there will be a larger number of night shifts operating throughout the country. Safety wise, who checks up on whom?

The industrial giants can have a safety department working at night but certainly the average safety director is on the job only during the day. While briefings, safety committee meetings or company-wide assemblies can be held in the twilight hours between shifts, the fact remains that constant safety supervision seems to be timed entirely in favor of the day shift.

Unless the employees are rotated on split-shifts, who provides fully adequate safety training for injury prevention at night? In most cases, there is no plant nurse on night duty unless, of course, the operation requires thousands of night workers.

It can be argued that night-time accident rates are better than figures shown for day workers. Is it possible that night accidents, especially the minor injuries, are not always reported by the supervisor or foreman? If a cut requires merely a wash, an antiseptic and an adhesive bandage, maybe the foreman is "too busy" to enter a written report for anything less than a protracted compensation case. This procedure, or rather the lack of one, may be instrumental in making night-time safety records look better than they really are.

Even when the night hours show no special activity, again who checks up on whom? The night watchman goes his rounds, utilizes mechanical check-in systems and then stumbles and falls because of a light burned out or poor plant housekeeping. Where has the safety program failed and who's to blame? If he must change a bulb or light tube and suffers a lost-time injury in the process, is this a night-shift accident or is it chargeable to faults of the day maintenance staff?

Even in the case of a few men working the evening or "owl" shift, management has the obligation to cover all night workers with the mantle of the safety program. Certainly, the plant engineer or director in charge of accident prevention earns his salt during the long daylight hours, but it would seem that management will find it extremely productive to call in a knowledgeable and responsible department head at regular intervals for the night workers. If a plant is to do its best job in the control of accidents, it is wise to remember the other half. Day-time casualties and injuries cost more money, directly and indirectly than ever before. Those occurring at night are not free!

● JUST FOR KICKS!

We may wring our hands and shake our heads when we read that slightly delinquent teenagers deliberately breathe in fumes and vapors of certain liquid adhesives just for kicks. We decry the antics of the younger element and sound off with instant sermons all beginning, "Now in *my* day," but do we actually know as much as we should about the inherent dangers of substances in common use throughout industry? How many supervisors or, for that matter, safety men know the properties of airplane adhesives, paints, solvents or resins? If the job requires softening a plastic in solvent, how much harm can the solvent do to the skin, the lungs and other organs of the human body?

It is not enough to insist upon adequate ventilation in the presence of carbon tetrachloride. Other solvents, liquids and substances in common use can be just as hazardous, especially in the case of protracted use.

We in industry are not exposing ourselves to temporary jags just for kicks. All the more reason to obtain the last word about the possible hazards of every single substance used in plant operations!

You can't always depend upon the label, but local authorities as well as casualty insurance company engineers can help prevent crippling for life and loss of that life.

And that's why this publication is stepping up its Industrial Hygiene section edited by one of the country's leading authorities in his field.

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The U. S. Government does not pay for this advertisement. The Treasury Department thanks, for their patriotism, The Advertising Council and this Magazine.

Over our shoulder

Many letters came in after our October issue complimenting us on the editorial New Look . . . but we never print "puffs" to ourselves or bouquets . . . only the brick-bats. So if you have a real gripe, let's have it. Who knows—it may be published on this page.

The double standard no longer is a matter of just morals (or the lack of them) . . . it's the double standard in everything. We make a grandstand play of "no dessert, thank you" and swill down two luncheon cocktails swimming in calories. Robert D. Gidel tells us (Page 8) that if we really knew how to *prevent* accidents, we wouldn't "go on strike to protest against a buddy being fired and then run him down with a high-powered car." Like our astronauts, safety today must go out of this world.

Safety seat belt standards are already out covering webbing, color fastness, belt assembly, buckle release, metal parts, etc., but there's still no assurance that floor pan washers or other car structure reinforcing plates supplied with the belt will be adequately strong. Society of Automotive Engineers says (Page 11) check with data from vehicle manufacturers but get those belts before you're forced to AND USE THEM!

There may be too many "Clubs". . . . In Canada, it would seem so. There's the "Crown" Club for those saved from serious injury by wearing safety hats; the "Ten On Two" Club for those whose toes have escaped injury with safety shoes; still another "Gladhatters" Club; a "Beaver's" Club and others whose members have been saved from injury by the use of safety equipment. Perhaps a single club (Page 16) might give greater prestige to its members. It's worth considering, anyway.

There's that word again! Yes, "motivation" . . . but this time in relation to artificial respiration training. You wouldn't think that anyone had to be "motivated" to saving a life even in the recognized, effective mouth-to-mouth technique (Page 48), but there's still much to be done, especially to emphasize the need to get going fast and forget being "nice" or fastidious. Let's forget the unimportant germs if we can save a life!

UP AND COMING

On the horizon for next month: First article in a new series on machine guards. A picture story on some standard and unusual methods of machine guarding at Martin Company. The second article in the Floor Maintenance series: How to "cure," seal and clean concrete floors. The third part of the First Aid series: New product developments in first aid equipment over the past 12 months. Highlights of the National Safety Congress.

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THE FUTURE SHOWS

Roanoke, Va. *November 2–3*

Fourteenth Annual Convention of the International Rescue and First Aid Association (Hotel Roanoke). Max L. Spray, Executive Director, IRFFA, 314 King St., Alexandria, Va.

Philadelphia, Pa. *January 22–25*

Thirteenth Annual National Plant Engineering & Maintenance Conference and Show (Convention Hall). Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

Dayton, Ohio *February 7*

Tenth Annual Miami Valley Safety Conference and Exhibit (Biltmore Hotel). Safety Council, Dayton Area Chamber of Commerce, Biltmore Hotel, Dayton 2, Ohio.

San Francisco, Calif. *February 8–9*

Twelfth Annual Governor's Industrial Safety Conference (Fairmont Hotel). Michael Flagg, Coordinator, 455 Golden Gate Ave., San Francisco 2, Calif.

Washington, D. C. *March 6–8*

1962 Biennial President's Safety Conference on Occupational Safety. Bureau of Labor Standards, Dept. of Labor, Washington 25, D. C.

Philadelphia, Pa. *March 7–8*

Twenty-eighth Annual Regional Safety & Fire Conference and Exhibit (Bellevue-Stratford Hotel). Harry H. Verdier, Executive Director, Safety Council, Chamber of Commerce of Greater Philadelphia, 121 S. Broad St., Philadelphia 7, Pa.

Fort Wayne, Ind. *March 20–21*

1962 Northeastern Indiana Safety Conference and Exhibit. Ivan A. Martin, Manager Ft. Wayne Safety Council, Chamber of Commerce Bldg., Ft. Wayne, Ind.

Dallas, Tex. *March 25–28*

1962 Annual Texas Safety Conference (Adolphus Hotel). J. O. Musick, General Manager, Texas Safety Association, 830 Littlefield Bldg., Austin, Tex.

Boston, Mass. *April 2–3*

Forty-first Annual Massachusetts Safety Conference and Exhibit (Hotel Statler Hilton). Bert Harmon, Manager, Massachusetts Safety Council, 54 Devonshire St., Boston 9, Mass.

New York, N. Y. *April 9–13*

Thirty-second Annual Greater New York Safety Convention & Exposition (Hotel Statler Hilton). Arthur F. Fuller, General Chairman, Greater New York Safety Council, 60 E. 42nd St., New York 17, N. Y.

Los Angeles, Calif. *April, 17–19*

Ninth Annual Western Safety Congress and Exhibits (Ambassador Hotel). Joseph M. Kaplan, Manager Greater Los Angeles Safety Council, 3388 W. 8th St., Los Angeles 5, Calif.

Columbus, Ohio *April 17–19*

Thirty-second Annual All-Ohio Safety Congress & Exhibit (Deshler-Hilton Hotel and Neil House). A. W. Moon, Congress Manager, Division of Safety & Hygiene, The Industrial Commission of Ohio, 700 W. 3rd Ave., Columbus 12, Ohio.

Philadelphia, Pa. *May 21–25*

Sixty-sixth Annual Meeting of the National Fire Protection Association (Sheraton Hotel). Deuel Richardson, Public Relations Mgr., NFPA, 60 Batterymarch St., Boston 10, Mass.

How does safety save

What's new in safety gloves and clothing

How can you stop accidents in advance

ACCIDENT and INJURY PREVENTION

How can machines be guarded

What is a "hard hat" area

Is Safety Today A-OK?

•

Safety Seat-Belt Standards

•

They Keep Safety Rolling

•

Stop Lights Control Lift Trucks

•

Safety Rules for Steam Hose

•

Two Hits to Eyes—No Errors

•

Helium Divers Talk Their Way to Safety

•

Why is safety a "must" to management

Where is safety eyewear a "must"

How can you spark safety interest

When should safety shoes be worn

What should safety inspectors look for

What are hidden costs of injuries

How should you select respiratory devices

IS SAFETY TODAY

by **ROBERT D. GIDEL**
Chief, Division of Safety
Bureau of Labor Standards
U. S. Department of Labor
Washington, D. C.

The men who pioneered in the safety field a scant 45 or so years ago, and those who got in the business when it got it's first pair of long pants, some 27 years ago, would flip at the concepts and responsibilities of a safety man now as compared with then.

How is the safety man today going to get his safety message across to both management and the employee? To make the most impression, you must personalize your pitch to his interest. "What's in it for me?" is the first thing asked.

If his reason and logic have flown (which often happens when a human is *personally* involved in a situation), you'll somehow have to supply him with some of your own making. If they haven't flown, then you still have to compete with all the diversionary elements our modern civilization provides in order to get through to him. (See the explanation at right.)

Now, in such a world, how can we get people interested in safety when so many of them feel there are more important and involved things to worry about than some dull, monotonous, routine such as "Look out or you will hurt yourself."?

We have to reach "the thinking man" as he reaches for his filter cigarette. They said it couldn't be done—but we have to do it.

We have to learn to count down, and learn when to blast off. We have to get into orbit and make sure our transmitters work on a receptive wave length.

Our problem isn't that we don't know how to prevent accidents. We have all the technical know-how, the systems for recording injuries and investigating injuries, methods of training and supervision, means for providing mechanical safeguarding and all sorts of personal protective devices and equipment. We have ways of finding out the toxic limits for hazardous materials and we know how to set up controls to cover any situation. These are easy.

Our main problem these days is getting the workers to *want* to prevent accidents. The problem is how to plant a spark of self-discipline in every worker.

If we expect to do this, we must compete with every other media (radio, TV, movies, newspapers, magazines, and imagination) in order to get through to the individual and personalize to him the need for looking out for his well-being. We must convince him that he must be safe as well as use a deodorant each day. He should protect his fingers and eyes as he does his teeth.

An aspiring author sent a manuscript to an editor with a note, "The characters in this story are purely fictional and bear no resemblance to any person living or dead."

A few days later he received his manuscript back with the pencil note, "That's what's wrong with it!"

Too many safety programs are like this story—they bear no resem-

How Can Safety Motivation

Ours is an era of confusions and dilemmas. We can't pick up the papers without reading about radiation fallout, mutations and new types of bombs. We aren't sure what to do with our money. If we wind up with an extra dollar, we're afraid to to save it since we stand to lose 50 cents due to inflation. The buy now, pay later fixation has us living years beyond our means.

We must either accept or condition ourselves to the philosophies of the Do-Gooders, the Joiners, the Agin-ners, the Conformists, the Beatniks and various other ideologies and cults.

We are in the era of the big bore and goof-off. We are snowed under by repairmen who can't repair, executives whose minds are executing maneuvers on the golf course, school systems full of cinch courses for students, and mothers who spend their time in clubs saving the world while letting their kids run wild. We are hep to three-day weekends, two-hour lunches and half-day coffee breaks.

It's also an era of double standards. We preach the evils of alcoholism and are 40 pounds overweight. We go on strike to prevent a buddy from being fired and then run him down in our car while he is crossing the street. We spend time sterilizing the

And that is the message we have to

None of us can base our judgments on

A-OK?

blance to the people they are dealing with.

It isn't easy to get through to people these days. You wouldn't try to sell a modern young girl a pair of high button shoes. You wouldn't try to sell a young hot-rodder on the benefits of his owning an old Essex. You wouldn't give your supervisors a five-minute safety talk in Latin. Yet, in effect, you're trying to do all three of these things unless you bring safety to the immediate, personal level of every worker by relating it to current events, current problems, current interests, personal objectives and benefits.

In other words, we've got to get our techniques out of this world, up with the stars, because that is where people are looking or their minds are functioning. We've got to make safety, for each individual worker, as intimate to him as anything else he owns, uses or covets. It has to fit like an old shoe to any and all occasions he faces hour by hour, day by day, on or off the job.

Specialists thrive in many industries and occupational fields, but a safety man cuts his own throat if he specializes.

Yet, there are countless "so-called" safety men who have one or two specialities and base their whole activities on these alone. Then, they wondered why they don't get results, or are fired. Some of these guys are:

The Committee Setter Uppers
The Safety Shoe Fitters
The Goggle Prescribers
The Inspectors
The 5 Minute Talkers
The Poster Paster Uppers
The Film Showers
The Report Writers and Keepers
The Frequency and Severity Figurers
The Investigators
The Job Analyzers
The Trainers
The Cost Figurers
The Guard Putter-Oners
The Blame Placers
The Chewer Outers
The Paper Shufflers

Just enumerating all these types indicates how foolish it is to think anyone could rely on only a few of them to conduct an effective safety program.

Compete in Such a World?

baby's food, then leave aspirin and other hazardous items lying around for him to snack on. We're against gambling for money, but put our lives up for grabs every time we take the car out of the garage.

Experts on human behavior also say modern man shares a dangerous tendency toward pattern thinking. That is, we base our judgments on past facts that may no longer be accurate. For example:

We drive through a certain intersection with a stop sign every day for years. Practically never see another car, so get in the habit of merely making a rolling stop and taking off without looking. One day, *Whamo!* and we've had it.

We work on a machine for years without a guard. We get our reflexes tuned to the cycle so everything is fine. One day, being human, our timing is off or something unexpected happens. *Whamo!* Look, Ma, no hands.

We grind tools periodically and regularly for years. Never use goggles or a window guard because in all these years not one particle has gone into our eyes. One day, *Whamo!* The ten millionth sliver finally hits an eyeball and puts it out of commission.

get across in accident prevention:

past facts that may no longer be accurate.

Are Safety Men Needed?

Another point: We safety men are really on very thin ground in our work.

If management would ever really get smart and . . .

1. Make their personnel staffs select and place on the basis of job requirements, matching personal qualifications and abilities.
2. Make their supervisors train and supervise on the basis of the individual elements and problems of the job.
3. Make their purchasers purchase on the basis of specifications considering hazards of materials, machines and equipment as well as operating specs.
4. Make their schedulers develop realistic due dates based on human as well as operational factors.
5. Make their layout, planning, and design men allow for the effective functioning of the human in the maze of the physical, mechanical and chemical environment.
6. Make their maintenance men set up procedures to keep machines, equipment and physical facilities operating safely and effectively, and
7. Make an effort to keep the physical, mental and emotional capabilities of the human at a high level.

If management did all these the safety profession could fold up and fade away, just as the demand for unmanned missiles is making manned aircraft obsolete.

Fortunately for safety men, industrial management has not yet become so proficient that it doesn't need a coordinator, or bird dog, to see that these things are actually accomplished. That's where we come in.

But to keep pace, many safety men must revise their philosophy and approach to accident prevention. If safety men are to convince production minded, cost-conscious management that they are more than ersatz professionals, they must display at least a working knowledge of the most modern production techniques and principles of management, these include:

Human Psychology
Personnel Selection and Placement
Job Analysis
Supervisory Techniques
The Physical Sciences
Training Techniques
Scheduling and Planning
Quality Control
Cost Analysis
Physical Inspection and Evaluation
Records and Reports
Investigative Procedures and Techniques
Maintenance Schedules and Procedures
Technical Research and Analysis
Layout and Arrangement of Production Facilities
Specifications and Standards
Material and Process Flow
Materials Handling, and Others

How much do you know about each of these subject areas? Are you up to date on them? Are they important to you?

If You Can't Beat 'em, Join 'em

Our bosses are production and efficiency minded. Certain things impress them; others do not. We can't expect them to see everything our way and to spend $10,000 on an item just because of the remote possibility someone might be hurt.

To help them appreciate the need for safety measures we must translate the results of our safety programs into their language. We have to conform to management policies, so if we learn to relate benefits from our safety programs to operations benefits, we'll be talking their language.

We must personalize the benefits of safety to management's interests —as well as personalize the need for the worker to look out for his own well-being.

Modern technology has complicated our traditional concept of accident causation—namely, unsafe acts and unsafe conditions. Improvement of human behavior is a great problem now—attitudes, incentives, motivation, etc. But modern technology is creating added risks which cannot be completely offset by improving human behavior. More and better engineering will be needed to offset human physical and mental limitations. This requires research into the extent of man's physical and mental capabilities and the adaptation of these capabilities and limitations to new concepts and ideas. *Human engineering* some call it.

Man needs time and help in accommodating himself to new machines, new environments and to new ideas . . . not only physically but psychologically.

We have made progress. What do we know about accident prevention today that can guide us for future accomplishments?

1. We know that the accident problem is no longer predominately a physical one—that it has to do with people—how they act, react, what motivates them, how to maintain their interest and support in working for their own welfare.

2. We know that safety doesn't stop at the plant gate. The safety training and education the worker gets on the job carries over to the home, at play, and on the road. That is why it is so important that they get some safety on the job. If a man is hurt on the road or in his bathtub he is just as absent from work as if he were hurt on the job.

3. We know that we must get safety into the schools, colleges, apprenticeship programs, vocational education—to educate and preserve our youth—since our youth are our future.

4. We know that you can't legislate safety. You can force compliance with certain bare minimums, with continuous policing—and we need codes and regulations to establish minimum standards. But to do an effective job the employer and the employee must both be sold on its worth. There must be set up in every working establishment in the nation a continuing day-by-day safety program participated in by every employee. You cannot establish that by legislation alone.

5. We know that trade unions must take up their responsibility to promote the safety of their members. Locals should have safety committees, internationals should have safety directors to provide assistance and guidance to the locals. The unions should cooperate with management in seeing that every job is accomplished in the safest way possible.

(Continued on page 22)

SAFETY SEAT-BELT STANDARDS

Condensed from the
"SAE Handbook Supplement TR-219"
Revised June 1961 report of Motor Vehicle Seat Belt Committee of the Society of Automotive Engineers, 29 West 39th Street, New York 18, New York.

These standards apply to single occupancy, lap-type seat belt assemblies for installation in motor vehicles.

WEBBING—Width of the belt webbing shall not be less than 1⅞ in. under no load and not less than $1\frac{13}{16}$ in. wide when subjected to a minimum test load of 4000 lbs. The webbing should not elongate more than 25% under 2500 lbs.

COLOR AND LIGHT FASTNESS—In accordance with tests for measuring transference of color, the dye in the webbing, whether wet or dry, should not harm clothing and the color should remain fast under federal standard light tests.

BELT ASSEMBLY—The belt assembly, including webbing, buckle, and adjustment and attachment fittings, should withstand a loop load of not less than 4000 lbs.

BUCKLE RELEASE—The belt buckle should release when a releasing force of not more than 45 lbs. is applied.

SLIPPAGE—Slippage of the webbing in the adjusting means at or near the buckle, in the release mechanism, and at the attachment fittings, should not exceed a total of 1 inch.

METAL PARTS—All metal parts should be free from burrs and sharp edges, and the mounting hardware should have withstood specified salt spray corrosion tests.

NOTE: Compliance with the requirements of SAE Standards does not provide assurance that, when the seat belt assembly is installed, the floor pan washers or other car structure reinforcing plates supplied with the seat belt will be adequately strong to sustain the test load specified for the belt assembly. Generally, a test of an installation in a car is necessary to determine the adequacy of the reinforcing plates. For recent models, data on tested anchorage installations can be obtained from the vehicle manufacturers.

States with Seat-Belt Requirements

California, Connecticut, District of Columbia, Michigan, New York, Ohio, Wisconsin—Effective January 1, 1962, all new passenger cars must be equipped with seat belt attachment devices for at least the two passengers in the front seat. (In New York, effective date is October 1, 1962. In Wisconsin, seat belts as well as attachment devices are required in 1962 models.)

California, Connecticut, Michigan, North Carolina, North Dakota, Pennsylvania, Utah, Virginia, Washington—Seat belts must meet specified standards or be approved by regulatory authorities.

Arizona, California, Indiana, Oregon—Motor Vehicle Departments recommend voluntary purchasers to select seat belts that meet specified standards.

■ ■ ■

Sources for Promotion Aids for Seat Belts

Reprints of magazine articles on seat belts and the film, "Holiday Massacre": American Motors Corp., Auto Parts & Assessories, 14250 Plymouth Rd., Detroit 32, Mich.

Copies of a Fact Sheet on seat belts, the booklet "Seat Belts Save Lives," and the film "Safety Through Seat Belts": Mr. Glen M. Bell, Jr., Sales Promotion Mgr., Automotive Sales Group, Chrysler Motors Corp., P. O. Box 857, Detroit 31, Mich.

Copies of the booklet "The Big Plus—Seat Belts": Mr. E. J. Riley, Manager, Parts & Service Promotion & Training Dept., Ford Division, Ford Motor Co., P. O. Box 568, Dearborn, Mich.

Promotional materials: Public Relations Staff, General Motors Corp., General Motors Building, Detroit 2, Mich.

"Fasten Seat Belt" dash stickers and the booklet "Seat Belts Save Lives": Mr. M. J. Ulaga, Studebaker-Packard Corp., 635 So. Main St., South Bend 27, Ind.

THEY ... SAFETY

A group of production, maintenance and safety supervisors, under the leadership of the Superintendent of the Maintenance Department, reviews a schedule of repairs and safety recommendations to see if a previously inspected department has complied with the items listed. Members then decide which department to inspect next.

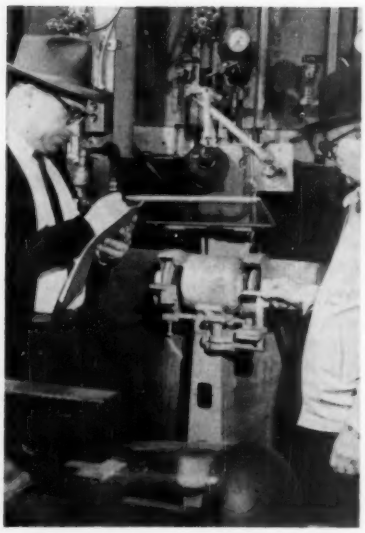
. . . the follow-through technique

LEFT—

Following the safety meeting, this two man inspection team (men standing), the first of six such teams that will go over this Sheetmetal Department, meets with the Department's general foreman. They notify him that his department is going to be inspected. Inspection of the Department is always made without any advance warning to the Department head, ensuring accuracy.

RIGHT—

After notifying the general foreman of the inspection and discussing any special problems he might be facing, the first team begins a thorough check of the department. In the photo at right, they note that a worn wheel on this stand grinder, used to trim metal, needs to be replaced, and that the safety glass shield is cracked and also needs replacement at an early date.



KEEP R-O-L-L-I-N-G

Timken Roller Bearing Company's Bucyrus, Ohio, plant has made effective use of two golf carts for mail runs, maintenance runs, or, if necessary, fire runs. Company personnel have modified the carts to meet specific plant needs. Aluminum pans have been installed on the rear of the carts for hauling replacement parts and supplies, and a fire-fighting wagon may be hooked on.

Encouragement, cooperation and follow-up have been the strongest planks in The Timken Roller Bearing Company's safety platform. The success of the program can be measured by its excellent safety record. The record has been excellent because the company has been able to enlist the voluntary and enthusiastic support of its supervisors and employees. With complete cooperation achieved, a continuous system of locating and correcting unsafe conditions became the company's most effective assurance of safety.

The Timken Company, in a serious effort to solve the problem of how best to make safety a *continuing* effort, has organized a system of safety inspection and correction. Initiated in 1952, the system involves the cooperative efforts of a group of production, maintenance and safety supervisors under the leadership of the Superintendent of the Company's Maintenance Department.

In the years that have followed, these men, working with the Company's Safety Department, have proved to be an invaluable asset in reducing the accident rate by reducing the accident potential.

The men involved in this continuing safety project are specialists in their respective fields. They are vested with the necessary authority, as supervisors, to see that a job they order is performed promptly.

A group meeting is scheduled every other Wednesday at 9 a.m. In conjunction with each Wednesday morning session, an inspection tour of a different department is also scheduled.

Following the regular meeting, members of the group are separated into six two-man inspection teams. The department selected for inspection is then visited by these teams and safety hazards or unsafe practices are noted.

Entirely informal and friendly in its approach, the group meets with the general foreman of the department at a time following their tour. They conduct a frank and open discussion of safety problems observed during their tour. The general foreman joins the discussion offering his suggestions and opinions on the subjects under consideration. Item by item is dealt with in the order established by the members of the group. Remedial action is planned at that

This is a special vibrating-type chip conveyor for delivering chips from the screw machine area to truck bed located outside the building. Mounted on reeds which are set into vibration by an electrically powered cam, the conveyor cannot be jammed by chips because of its oscillation. It takes about two minutes for chips to move from their point of entry to point of delivery.

time. Prompt and efficient follow-up is assured since the personnel involved are the very men who would be obliged to correct the unsafe conditions anyway.

To each safety problem on the agenda is attached a note describing the action taken. As long as a safety problem has not been adequately remedied to the group's satisfaction, that item stays on their agenda. This also assures proper follow-up.

At the conclusion of these departmental safety tours, each member of each team submits his notes, taken during the tour, to the man serving as secretary for the group. The notes are then checked to eliminate duplication and placed in proper sequence. No later than five days following the tour, the secretary will deliver mimeographed copies of the report to group members, the general foreman concerned and to top members of operating management.

The general foreman and members of the group then have approximately a week and a half to correct any unsafe conditions that were noted by the teams. The general foreman receives the unqualified cooperation of the safety teams to make certain that this safety job is done correctly and expeditiously.

Although The Timken Roller Bearing Company's safety record has been excellent for many years before this safety group was organ-

(Continued on page 16)

Large mirrors have been installed on the corners of blind aisleways, serving as a safety device in preventing collisions. The mirrors have proven to be especially useful in warning personnel of the approach of a loaded hand truck.

Company police and plant service dept. employees wear fluorescent vests for working in certain congested areas during peak hours. Treated cotton vests make men more visible at dawn or dusk.

Eye protection is an important part of the safety program. If employees' occupations require eye protection, the company furnishes, free of charge, the correct type of protection, including safety glasses ground to the wearers prescription. In addition, boxes containing clip-on safety glasses for visitors are located throughout Timken plants in areas where they may be needed.

FAR LEFT—

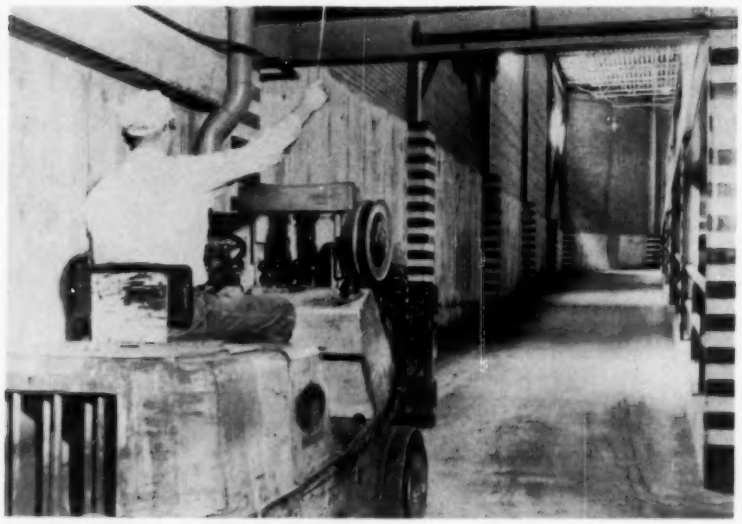
The latest fashions for fire safety may look out of this world, but they are carefully designed to keep the wearer in this world. An aluminum reflectorized suit, designed to reflect over 90% of outside heat, while raising body temperature to only 101 degrees, is one such safety fashion.

LEFT—

This self-contained breathing outfit provides pure breathing for Timken firemen, should they be called on to enter an area contaminated by fumes or smoke. It is easily carried and allows the fire fighter complete freedom of movement, while giving him complete protection against fumes or smoke.

A Salute to

A SAFETY IDEA



Stop Lights Control Lift Trucks

Six hundred trips a day make a super highway out of a ramp in the Bleached Board Division plant of West Virginia Pulp and Paper Company, Covington, Virginia. The company produces Kraft paper and paperboard in the manufacturing area of its plant and stores paper rolls in the basement. Mechanized lift trucks move the rolls down the 6 percent ramp to storage. Since the ramp has a blind corner, a system of traffic lights has been set up to prevent more than one truck from using the ramp at the same time.

As a truck approaches the ramp, the driver checks a traffic light and proceeds if it is green. Upon entering the ramp, he pulls a conveniently placed cord which changes the light to red at both the top and bottom of the ramp. As he leaves, the driver re-sets the light for the next driver. This traffic system has allowed West Virginia Pulp and Paper Company to use their lift trucks safely with maximum efficiency.

Picture by courtesy of Automatic Transportation Co.

ized, their work has made an even further improvement on that record.

Sharing full credit with the safety group, of course, is the permanent Safety Department. The Timken Safety Department was organized as a department with a full-time supervisor, in 1923. It is, in substantial measure, responsible for the fact that the company has the lowest industrial compensation rate for an industry in its class in the state of Ohio. These rates are based upon the accident rate of any given industry. The higher the accident rate, the higher the rate which the industry pays into the industrial compensation fund. The lower the number of accidents, the lower the payments to the compensation fund.

With the continued cooperation of the special safety unit, the Safety Department, supervisors and employees, the company's accident rate should continue to remain well below the incidence of accidents in the home.

Encouragement, cooperation and follow-up, rather than coercion, discord and complacency, have paid dividends in good safety practices, high employee morale and increased bearing production at the Timken Company.

Are There Too Many Safety "Clubs"?

Annual Meeting of Canadian Industrial Safety Association Holds Panel Discussion

The Annual Meeting of the Canadian Industrial Safety Association held in Winnipeg recently represented Industrial Companies, Safety Associations, Workmen's Compensation Boards, Railways, etc.

A feature of the program was a panel discussion of the various Safety Clubs that have been established in Canada as a means of recognizing workers who have been saved from serious injury or death by wearing safety hats, life vests, safety shoes, etc.

At the present time the Industrial Accident Prevention Associations of Ontario sponsor "The Crown Club" for those who have been saved from serious injury by wearing safety hats; "The Ten on Two Club" for those who have avoided serious toe or foot injuries by wearing steel toe safety shoes. The Construction Safety Association of Ontario has "The Gladhatters Club" to recognize Ontario construction workers who have been saved from serious injury or death because of wearing a safety hat; The Lumbermen's Safety Association of Ontario, and The Ontario Pulp and Paper Maker's Association in conjunction with the Quebec Pulp & Paper Safety Association established "The Beaver Club" for workers in bush operations who have been saved from serious injury or death by wearing a safety hat or life vest; and out in British Columbia The Workmen's Compensation Board established "The Prudent Penguin Club" for workers saved from drowning by wearing floatation equipment or life vests.

The negative side took the position that there are too many of these clubs and that the prestige of such awards has been reduced, and that one single recognition club of this kind under the jurisdiction of a national organization such as Canadian Industrial Safety Association would serve a more useful purpose. At the same time it was agreed unanimously that "The Wise Owl Club" established by the National Association for the Prevention of Blindness in New York, and currently administered in Canada by The Canadian National Institute for the Blind, has gained world wide recognition. Membership in "The Wise Owl Club" is generally considered to be the highest recognition available to those who have saved themselves from possible loss of sight by wearing eye protection.

New officers for 1961–'62 are: Mr. M. H. Miller, Safety Director, Dominion Tar & Chemical Ltd., Montreal—President; Mr. V. J. Doody, General Manager, Transportation Safety Association of Ontario, 1st Vice President; Mr. R. E. Smith, Safety Director, Mannix Company, Ltd., Calgary, Alta., 2nd Vice President; R. H. Lucas, Safety Director, Canadian Petrofina Limited, Pointe-aux-Trembles, Que., Secretary-Treasurer.

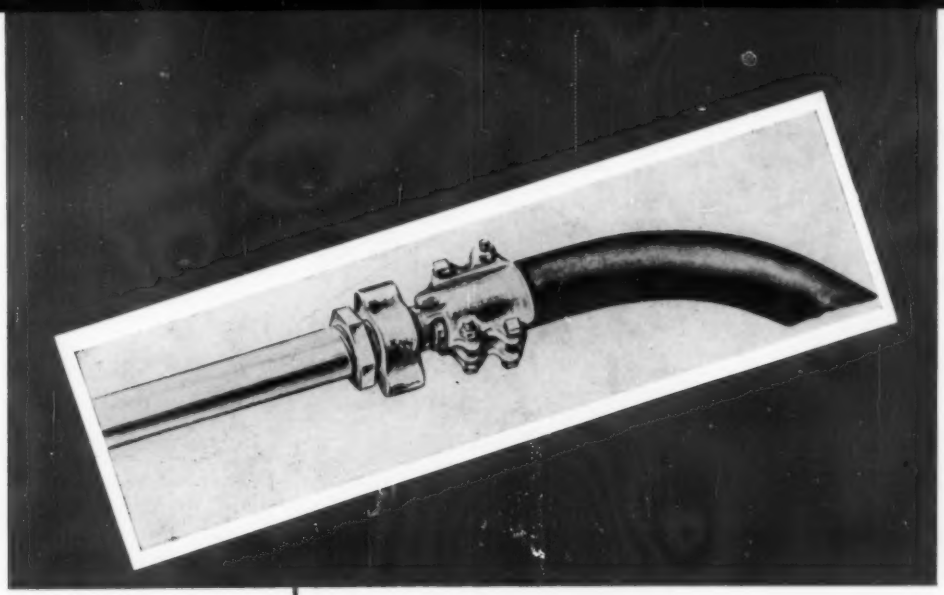


Fig. 1.—Metal pipe between source of steam and steam hose. Note clamp couplings.

SAFETY RULES FOR STEAM HOSE

Engineers of The Gates Rubber Company offer these safety rules which should be observed when using steam hose.

1. **Select the correct hose for the job.** Rated working pressures and temperatures must not be exceeded.

2. **Use proper couplings.** Interlocking, clamp type couplings are best because they can be tightened as necessary.

3. **Use pipe between steam generator and saturated steam hose** to protect the hose from local superheat conditions. (Figure 1)

4. **Avoid sharp bends in hose.**

5. **Protect hose from crushing** by industrial trucks and heavy machinery. (Figure 2)

6. **Inspect hose frequently.** Recognize danger signs which precede hose failure, such as, cover deterioration or blisters, restricted or brittle tube, leaking steam.

7. **Wear safety clothing when using steam hose:** Safety glasses, gloves, rubber boots, rubber apron reaching below the boot tops.

8. **Grasp hose firmly at or near the nozzle** to keep the hose from whipping.

9. **Turn steam on and off at the source rather than the nozzle.** Never leave steam hose under static pressure unnecessarily.

10. **When turning on steam, point nozzle at the floor** until steam flow is adjusted.

11. **When using a steam-water mixture, always turn the water on first,** then the steam. **To cease operation, shut off steam first,** then the water.

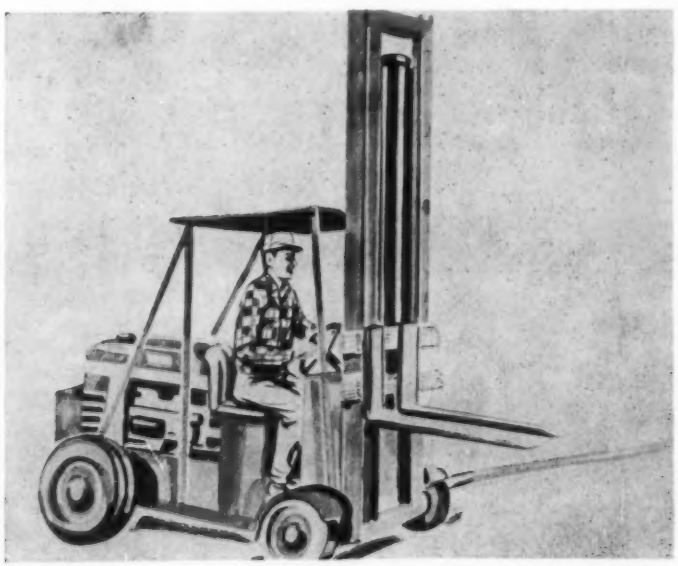
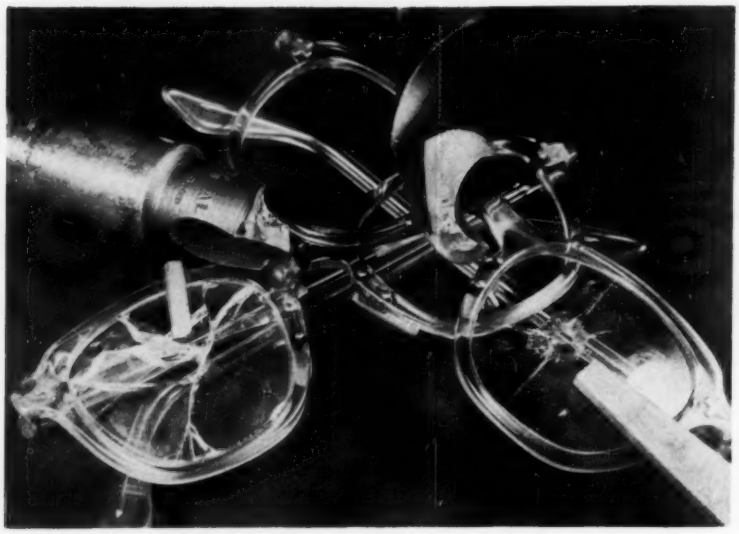


Fig. 2.—As shown in this photograph, the steam hose needs protection against accidental crushing by fork lift trucks or other heavy vehicles.

(Continued on page 18)

Another Injury Checked



Two Hits to Eyes–No Errors

Anyone not convinced about the value of safety eyewear? A talk with Don Maffei, radial drill-press operator in a Westinghouse plant, would change his mind. Don's eyesight was saved by safety glasses not once —but twice—in ten months.

Don had his first experience in the positive value of safety glasses when a drift pin he was using on a job cracked, and the end flew back, hitting the left lens of his glasses squarely in the center. No injury to his eyes.

Ten months later he was using a ⅞-inch bit while working on a drill press. The tip gave way. A piece flew up and struck the right lens in Don's safety glasses. For the second time his eyesight was saved.

The picture shows both sets of safety glasses along with the tools that tried to rob him of his sight.

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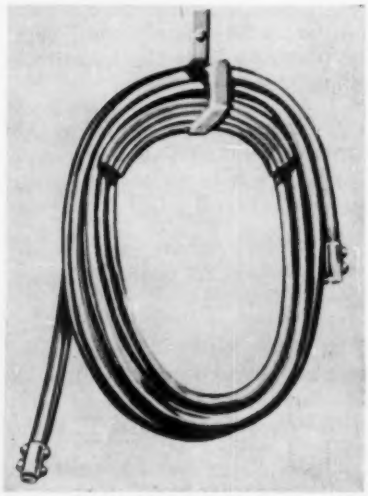
12. Steam hose should not be used to carry other materials and then returned to steam service.



Do not hang the steam hose on a nail or hook. For safety, support hoses with a large radius regulation wall bracket.

13. Be sure hose is grounded when it is used to clean tanks which have contained combustible materials.

14. Drain hose and wipe the cover dry after use. Store hose in a cool, dry place when not in use. Store flat or on a large radius wall bracket. (Figure 3) Never hang over a nail or hook.

Scrap Industry Safety Contest

Entries are now being accepted in the 13th Annual Safety Contest sponsored by the Institute of Scrap Iron & Steel, Inc. for its members. The primary purposes of the competition are to improve safety habits and practices within members' yards and reduce accidents and time lost through injuries.

Over the past four years, the contest has helped stimulate a reduction in the participating members' average injury rate each year. As a result of the safety contest's benefits and the overall industry safety program, the Institute has been presented a National Safety Council award four times.

There are three classes of competition again this year: for yards with 10 or fewer employees; 11 to 30; and 31 or more. The contest period extends from January 1 through October 31 of this year.

Three awards, either plaques or permanized, mounted certificates depending on the standing, are given in each class. Firms completing the full contest period without an accident will receive Certificates of Safety Achievement, while those whose injury frequency rates are below the national average as established by the contest will receive Letters of Commendation.

All awards will be made at the annual convention of the Institute to be held in Washington, D. C. in January, 1962.

Federal Safety Council New York Meeting

Brigadier General Howard Snyder, Chief of Staff for the First U. S. Army, welcomed members of the Federal Safety Council of the Greater New York Area to their Fall Conference at the Fort Jay YMCA on Governors Island, N. Y., on September 13th.

General Snyder, indicated that much of the responsibility for safety practices rests at the supervisory level, and through proper supervision, accidents can be prevented. He pointed out, however,

(Continued on page 23)

LOSS STOPPERS

The free bulletins and catalogs reviewed below are offered by the Reader Service Department of this publication. To obtain copies without cost or obligation, write in the key numbers on the Reader's Inquiry Card.

INDUSTRIAL HYGIENE

Dust & Fume Control 356
Pangborn Corp. Several effective methods for controlling dust and fume are described in this 20-page booklet. Includes data on advantages of dust control and the essentials of a dust control system. Illustrates various types of collectors including new exhaust hood for electric furnaces and new cloth tube collector.

Sound Survey Meter 357
Korfund Co. New brochure describes a hand-held sound survey meter to check noise levels for industrial hygiene and preventive maintenance programs.

Film Badge Service 358
R. S. Lenauer, Jr. & Co. 8-page brochure describes radiation monitoring services, including data on the different types of badges and the evaluation and control methods, that comply with new Federal regulations.

Exhaust Hood Filters 359
Cambridge Filter Products Corp. An engineering bulletin describes a line of disposable interception filters adaptable to room recirculators, kitchen range hoods, dust-free hoods, lab benches, etc.

Membrane Filters 360
Gelman Instrument Co. Informative 24-page booklet describes a membrane filter for air sampling, fluid cleaning, contamination control and a wide variety of laboratory uses. Gives full data on filter characteristics, filter holders and accessories, and a table showing solvent compatibility.

Protective Barrier Creams 361
Ayerst Laboratories. Bulletin describes two types of protective barrier creams to prevent industrial dermatitis. Lists products and chemicals against which each cream offers protection. Includes data on dispensing equipment and tube packaging.

PERSONAL PROTECTION

Air Line Respirators 362
Mine Safety Appliances Co. Four facepiece selections for use with a constant-flow air line respirator are described and illustrated in this bulletin: two styles of full-face masks, and two half-masks covering just the mouth and nose area. Also features data on the air flow control valve, portable air line equipment, and accessory devices.

Industrial Apparel 363
Workon, Inc. This 1961 Fall catalog offers a complete line of general industrial clothing that resists deterioration by chemicals, also static-free and lint-free types. Includes shirts, trousers, coveralls, lab coats, women's dresses and slacks, gloves, shoe covers, etc., made of synthetic fabrics, including new materials.

Safety Shoe Program 364
Safety First Shoe Co. Folder outlines a safety shoe program that requires no stocking of shoes: It provides a portable display kit with samples of six popular safety shoes, a foot-size measuring device, and full instructions and materials for ordering from central warehouses. Also gives data on a safety shoe club.

Welder's Protective Equipment .. 365
NCG Division, Chemetron Corp. This 20-page well-illustrated catalog covers personal protective equipment for welding and cutting: helmets, hand shields, goggles, safety glasses, hats and caps, face shields, portable screens, gloves and mittens, and accessories.

FIRE PROTECTION

Fire Fighting Clothing 366
Wheeler Protective Apparel, Inc. This 12-page catalog features a full line of aluminized asbestos clothing for fire and high heat hazards: suits, cover coats, helmets, gloves, overshoes, etc. Also includes fire blankets, curtains, covers, salvage cloths, etc.

Fire Doors & Exit Hardware 367
Overly Mfg. Co. New technical booklet describes a line of over 90 different fire door styles including data on U.L. testing and a quick-selection chart for fire door hardware. Includes hollow metal and Kalamein tin-clad, and metal frames.

Explosion-Proof Walkie Trucks ... 368
Clark Equipment Co., Industrial Truck Div. This 4-page bulletin explains the spark-enclosed construction of electric hand trucks that meet U.L. specifications for areas containing highly combustible materials. Gives data on nine models and explains 16 special safety features.

(Continued on the next page)

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NOVEMBER, 1961 **Please send me the following free data**

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Loss Stoppers (Cont'd)

MAINTENANCE

Rust Treatment 369
Rusticide Products Co. 4-page folder describes a metal treatment applied by brush or spray to rusted metal to stop the rusting action and provide an inert, hard surface for regular paint. Also gives data on preparing new metal for paint, including galvanized and aluminum.

Cold Weather Concreting 370
Master Builders Co. This placard for use on bulletin boards at job sites, engineer's and contractor's offices, etc., gives the basic do's and don'ts of laying concrete in cold weather. Includes data on accelerators, preparation of forms and subgrade, protection and curing. Also has a chart showing correct water temperature to obtain desired concrete mix temperature.

Winter Asphalt Protection 371
Maintenance, Inc. New bulletin shows how use of a sealer coating will protect asphalt pavements against damage from de-icing chemicals by preventing water penetration and by speeding natural thawing of ice and snow.

Electrical Tapes 372
Plymouth Rubber Co. Full line of electrical friction tapes is presented in this 8-page short-form catalog. In addition to standard tapes of rubber or plastic, includes new types such as an all-temperature vinyl; molding putty-like rubber; oil-resistant neoprene splicing.

Plastic Floor Coating 373
Monroe Co., Inc. Catalog sheet describes uses of a clear, non-slip floor finish that has a polyvinyl base, contains no wax, is self-polishing and long wearing, and has a U.L. listing.

Area Lighting Guide 374
General Electric Co. This 30-page bulletin describes a complete area lighting line and includes an equipment quick-selector, sample lighting layouts, typical applications, product data, etc.

What's Your Problem?

- **Has an accident or fire interrupted production?**
- **Want to know how to prevent it?**
- **Do you need background information on equipment for industrial safety, hygiene, or maintenance?**

As a service to its readers, this publication will arrange to supply manufacturers' literature on the following subjects. Just insert the key number on the Readers Inquiry Card on the preceding page and be sure to fill in your name and address. If you need information on a specific type of product, simply write it in on the Inquiry Card.

Key Number	Subject
	PERSONAL PROTECTION
101	Safety Goggles
102	Face Shields
103	Lens Cleaning & Anti-Fogging Equipment
104	Sweat Band
105	Hard Hats
106	Respirators & Masks
107	Protective Clothing
108	Women's Protective Caps
109	Safety Belts
110	Safety Gloves
111	Electrical Gloves Tester
114	Welding Helmets
115	Fire Fighting Suits
116	Aluminizing Touch-Up Kit
117	Safety Shoes
	FIRST AID AND HYGIENE
120	Protective Skin Creams
122	Sanitary Drinking Facilities
124	Salt Tablets
125	Resuscitators
126	Antiseptic Medication
127	Burn Medication
127A	Poison Ivy Immunizer
127B	Poison Ivy Medication
128	First Aid Kits & Supplies
129	Stretchers & Litters
129A	Stretcher Cases
130	Throat Medication
131	Eye Wash Fountains
131A	Emergency Showers
132	Portable Ventilators
133	Dust Collectors
135	Hearing Protectors
137	Noise Mufflers (machines)
	FIRE PROTECTION
141	Safety Cans
142	Fire Alarms
145	Welding Curtains
148	Watchmen's Control System
149	Fire Blankets

Key Number	Subject
	LIGHTING AND WARNING DEVICES
150	Alarms & Warning Lights
153	Fluorescent Lamp Guards
154	Emergency Lights
155	Truck Back-Up Alarms
	MAINTENANCE
161	Anti-Slip Waxes & Finishes
162	Floor Cleaning Compounds
163	Floor Cleaning Machines
164	Floor Resurfacing Compounds
165	Oil Absorbents
166	Toilet Sanitizers
168	Ultrasonic Flaw-Detector
	LADDERS & HANDLING
170	Ladders
171	Ladder Safety Devices
172	Scaffolds
173	Work Platforms
174	Emergency Ladder Rungs
175	Safety Hooks
176	Folding Truck Steps
177	Carboy Pumps
177A	Chemical Resistant Pails
	GUARDS
178	Machine Guards
179	Power Press Feeders
180	Safety Tools
181	Vacuum Sheet Lifters
182	Valve Operators
184	Safety Lock-Outs
185	Lock-Out Air Valves
	EDUCATIONAL AIDS
191	Safety Signs
192	Safety Awards & Emblems
193	Employee Safety Guide
195	Changeable Letter Signs
197	Safety Training Films

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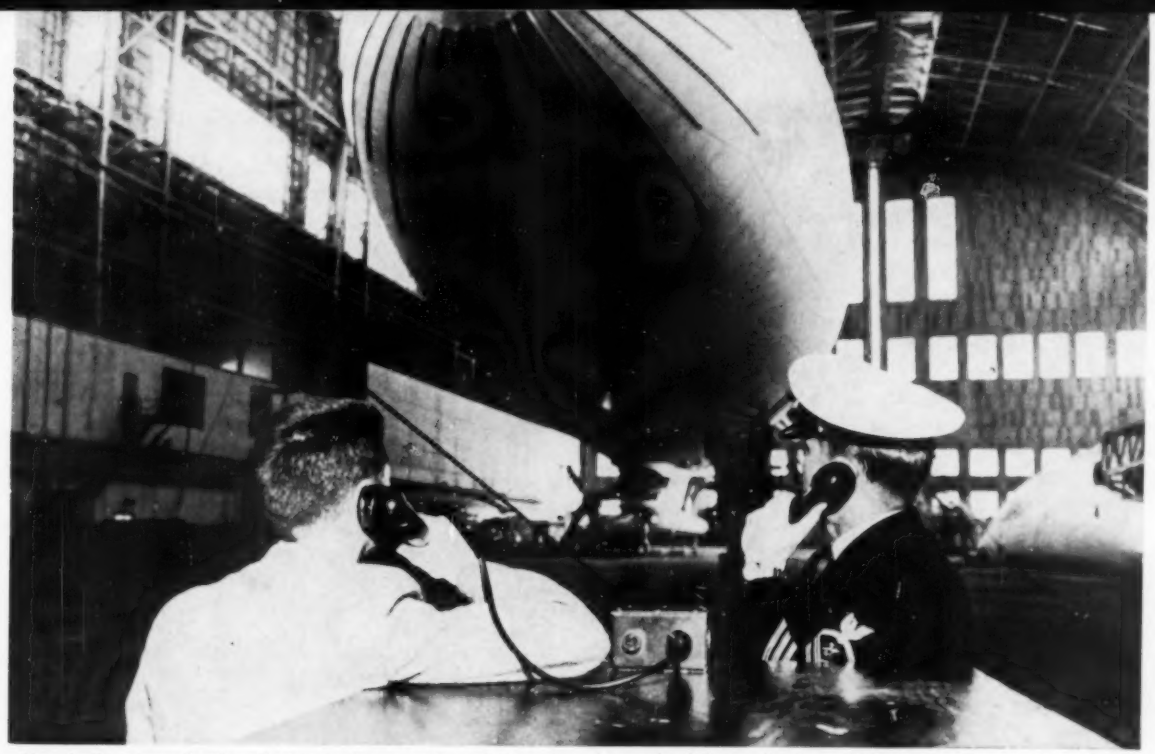

Constant communications between divers and control center is required during "helium diving" operations in New Jersey.

Helium Divers TALK Their Way to Safety

In a unique occupation known as "helium diving," the vital breath of life for each participant is dependent on specially designed respiratory and communications equipment.

Comparable to deep sea diving in its physical aspects, helium diving is conducted as a land operation by the United States Navy. Divers, located at the Lakehurst, N. J., Naval Air Station, have but one purpose and that is to equip the Navy's huge airships, or "blimps," with radar, communications, and electronic apparatus. The equipment is installed by "diving" into the helium-filled bags of

Each diver checks the other's mask-communications equipment before entering the helium-filled atmosphere of a blimp.

Gear is laid out and inspected by two divers preparatory to entering the helium filled bag of a Navy airship.

The buddy system is employed by these two divers as they prepare to "dive" through zippered envelope of giant blimp.

the airships. It is too massive for installation in the ships' relatively large gondolas (90 feet long).

Success of any dive requires not only the skill and experience of the diver but equipment that is reliable. Respiratory equipment has been adapted to the needs of the Navy's helium divers. The key component combines a mask with a sound-powered telephone unit. The complete assembly includes a transmitter, and earphones with head harness. It contains a speaking diaphragm that gives clear, crisp, voice communication.

Assuring the wearer of safety in a gaseous atmosphere, the equipment, except for the air supply, is completely self-contained and operates without the use of batteries or external power. Air supply for the divers comes from a blower located next to the airships at the bottom of a standby scaffold. A qualified attendant is responsible for the operation of the pump. In case of emergency, a hand-crank unit is also available.

Two divers work together as a "buddy team" inside the bag to assure each other's safety. Instant, reliable communication between them and the remote control point is of prime importance. Both divers are required to carry on a conversation in the helium-filled atmosphere.

Drowning Danger

Helium, while not poisonous, will not support life, so that a person breathing only that gas would "drown," just as he would in water. Inhalation of helium renders an individual unconscious, and according to the Navy, exposure to the gas for more than 73 seconds is fatal.

Should either diver stop talking, or should one's voice change pitch due to the effects of helium leaking through an ill-fitted mask, the attendant assigned to the outside phones would alert the other diver to rescue the man from the ship. A standby diver would also be instructed to assist in the effort.

The standby diver, stationed on the scaffold next to the ship, wears a sling mask which is equipped with a portable oxygen cylinder. Air hoses are not required for the sling mask which has its own self-contained oxygen supply.

"Helium diving" instructors at Lakehurst Naval Air Station, N. J., are Albert DeCarlo (left) and Charles Theibault.

Communications are coordinated by a qualified attendant at the remote control station. All diving is conducted under direction of a supervisor who ascertains when work should be started or stopped on a ship. He also is responsible for certifying that all equipment and personnel are in place and ready for diving operations. He issues verbal orders through the communications center or directly by phone.

All airships are maintained on a preventive maintenance schedule. Helium dives are made periodically to inspect or adjust equipment to insure efficient operations when a ship is airborne.

Diving saves the time and expense of deflating and later re-inflating the bags with costly helium. The method allows the Navy to install all the latest communications devices and makes the airships an important part of the fleet's anti-submarine warfare patrol units.

Two Instructors

Leading authorities in this relatively small field are Charles Theibault and Albert DeCarlo. Both are instructors in the art of helium diving, and they represent the only two people in the world today who qualify for the position. Under their tutelage, some thirty-five other people have shared in helium diving experiences.

DeCarlo is credited with a dramatic rescue of a helium diver in 1953. Time for the rescue was 38 seconds.

Developer of Technique

The loquacious Theibault is largely responsible for developing the virtually fool-proof diving method. His own manner of keeping up a continuous conversation suggested to him that a diver should be speaking at all times once inside a helium-filled bag. Adopting the idea paid dividends in DeCarlo's stirring rescue of the unconscious diver.

Pictures by courtesy of Mine Safety Appliances Co.

Safety A-OK?

(from page 10)

6. We know that even though more glamorous and dynamic developments occur, scientifically and productively—the same old horse and buggy causes of injuries will still be killing and hurting most of the people. We'll trip over something, fall off something, be struck by something, take chances, not read instructions, go too fast for conditions, take short cuts. For example—1,000 years from now they'll read of the joker who knocked himself off because he didn't know his rocket gun was loaded.

7. We know you don't sell a businessman on initiating a safety program just because someone might get hurt, or did get hurt on the job. They have to be convinced that it is good business—and there are plenty of statistics showing this.

In a survey, by the National Association of Manufacturers, of companies having accident prevention programs, it was found:

1. Compensation insurance premiums were reduced.

2. Absenteeism was reduced—Better place to work.

3. Labor turnover was reduced—Better place to work.

4. There was an improved efficiency in operations.

5. There was a higher regard for the company in the community—better public relations.

6. 90% of these companies had employee representatives on their safety committees.

From our past experience we can show that:

1. It pays to prevent accidents.

2. Accident prevention is within the ability of any reasonably competent management.

3. The investment required is well within the means of any going business.

4. The great majority of work-connected injuries are practicably preventable.

Where Do We Go From Here?

We have been using a lot of ideas and techniques in the safety field that we have not evaluated completely. We use films, posters, meetings, warnings; but we don't know the exact effect on individuals.

We know that some individuals are affected by films or posters, but we don't know for how long a period. We have to develop better means of evaluating the effectiveness of various techniques.

We must also learn if it is possible to detect beforehand how people will react to different environmental media—such as noises, tension, temperatures, light, radiation, automation, speed, etc.

Adapt and Prepare!

Industrial accident prevention is a dynamic business. It cuts across all lines: Research, Engineering, Production, Promotion, and Personnel. It must keep one jump ahead of industrial development—and that's a little like trying to say how many children you'll have before you get married.

Whether we continue to make progress will depend upon how we adapt to the present and prepare for the future.

From an address presented at the 50th Greater New York Safety Convention.

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(For details, use Key # L-3 on inquiry card on page 19)

Federal Safety Council

(from page 18)

that safety must be the concern of everyone regardless of his position.

Principal speaker John M. Wolverton, of the Office of the Chief of Engineers of the Department of the Army, discussed Fire Prevention. Deputy Chief J. Love of the New York Fire Department also spoke to the more than sixty fire and safety leaders of state and city agencies who joined their federal confreres for the fall meeting.

Consistent with a statement by President Kennedy, the Council carries out a continuing, agressive accident prevention program throughout the various federal agencies. The Fall Conference provided an opportunity for an exchange of ideas and information among safety representatives of the Armed Forces, the Veterans Administration, Customs Service and other federal agencies in the New York area.

SAFETY ON FILM

New Film On Soil-Cement Mixtures

Standard Laboratory Control of Soil-Cement Mixtures, a new sound and color 16 mm. motion picture of the Portland Cement Association, was given its premiere showing at the recent Annual Meeting of the American Society for Testing Materials in Atlantic City.

The film was shown during the Session on Soils, sponsored by Committee D-18 on Soils for Engineering Purposes. It was this committee that in 1940 gave formal recognition to the then-new paving material by publishing tentative laboratory test methods for soil-cement. These test methods were adopted by the committee as standard in 1944, and revised in 1957.

The new film describes current ASTM-AASHO laboratory test methods that determine the quantities of cement and field control factors necessary for building soil-cement pavements. Latest short-cut test methods for sandy soils are included.

"Standard Laboratory Control of Soil-Cement Mixtures" is available free on loan in the United States and Canada from the Portland Cement Association, 33 West Grand Avenue, Chicago 10, Illinois.

N. J. Film Library

Six new additions have been made to the film library of the Bureau of Engineering and Safety, the New Jersey Department of Labor and Industry has announced.

Purchase of the 16mm., color and black and white sound films was made possible through a $700 grant from the New Jersey Industrial Safety Committee, a semi-official group which acts as an advisory body to the Commissioner of Labor and Industry.

The new additions include four short films in the Communications for Safety series, "Setting 'Em Straight," "Take a Talkie Break," "Let's Talk About Safety," and "Let Everybody Help." The others are: "Growing Pains" and "Knowing Is Not Enough."

Communications for Safety films run eight to ten minutes each. The other two run approximately thirty minutes.

Industrial and business firms and organizations may make arrangements to see the films by contacting the Safety Promotion Section, Bureau of Engineering and Safety, 1100 Raymond Boulevard, Newark 2, New Jersey.

NBFU Film Wins Merit Award

The Science of Fire, the National Board of Fire Underwriters newest educational film, has been awarded a certificate of merit by the Vancouver Festival Society. The 20-minute 16mm color film was selected for presentation in the science and agriculture category of documentary films at the Society's fourth annual International Film Festival held in Vancouver.

It tells the story of fire, the principles of combustion and how fires can be prevented, covering flash points, ignition temperatures, vapor travel and methods of extinguishment. The newest addition to the NBFU library of 30 educational films was produced by MPO Productions, Inc., New York.

Free Scaffolding Film

More Profits For Builders is the title of a new 16mm sound-color motion picture released by Beaver-Advance Corporation, Ellwood City, Penn. The film shows basic scaffolding set-up and how it is used in all kinds of construction and maintenance work across the nation. Many interesting and unusual scaffolding applications are shown including industrial buildings, apartments, aircraft hangars, ship building, churches, theaters, bridges, reservoirs, etc.

The 20-minute film is available on free loan to contractors, builders, engineers, trade groups, architects, municipalities, colleges, universities and others interested in building and construction. Write direct to Thos. J. Barbre Productions, Library Division, 2130 So. Bellaire St., Denver 22, Colo.

Film Catalog

Association Films announces publication of the Golden Anniversary edition of its 1961–62 catalog, *"Free Loan Motion Pictures and Selected Rental Subjects."* Available free of charge, the all-new 32-page booklet designed specifically for adult groups, presents an extensive listing of its free loan film library.

Variety of Films

Describing films for adult groups of all kinds, this comprehensive and concise catalog describes films which are appropriate to club meetings, community organizations, in-plant training and safety programs, and many other adult groups.

Copies of the 32-page Adult Catalog of "Free Loan Motion Pictures and Selected Rental Subjects" may be obtained from Association Films' regional distribution centers in: Ridgefield, N. J. (Broad at Elm); La Grange, Ill. (561 Hillgrove Ave.); San Francisco, Calif. (799 Stevenson St.); and Dallas, Tex. (1108 Jackson St.).

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(For details, use Key # L-4 on inquiry card on page 19)

Safety In Entering Tanks

An eight-page pamphlet on recommended safe practices and procedures for entering tanks and other enclosed spaces is now available from the Manufacturing Chemists' Association, Inc. The publication, 10th in the Association's Safety Guide series, emphasizes that hazards inherent in tank entry can be avoided or overcome by following three basic principles. They are:

"Establish a definite system of pre-planning for tank entry and a worker instruction program;

"Prepare the vessel for entry by physically isolating it, cleaning it to remove contaminants, and testing it to insure absence of such contaminants;

"Use a formal permit system, requiring written authorization for entry, to be issued only after the supervisor in charge is satisfied personally with tank preparation, precautions to be taken, personal protective equipment to be used, and procedures to be followed."

Responsibility for safety, both at the time of entry and during the entire operation rests with the supervisor, the pamphlet states. Such responsibility also covers conditions of work for contractors' employees and workmen from other divisions as well as for his own men, it points out.

Among the hazards commonly present, the MCA publication states, are: Toxic vapors in fatal concentrations; flammable gases with potential fire or explosion; lack of oxygen, causing asphyxiation; electric shock from portable lights, tools, or associated electrical equipment; injury from mechanical equipment such as mixers, conveyors, etc., inadvertently activated; bodily injury from direct contact with corrosives or dermatitis-producing chemicals; physical hazards such as slipping, falling and falling objects; and burns resulting from accidental opening of a steam valve in a line which has not been blanked off or disconnected.

The pamphlet suggests a sample work permit for employees entering the tank or enclosure and also recommends tools and protective clothing needed by employees.

SG-10 is available from the Manufacturing Chemists' Association, 1825 Connecticut Ave., N.W., Washington 9, D. C. for 30 cents a copy.

ASSE Elects

Dr. John V. Grimaldi, consultant, safety and plant protection, General Electric Company, New York City, was elected president of the American Society of Safety Engineers at the Society's Annual Meeting on October 16 in Chicago.

Other officers elected include:

Michael F. Biancardi, manager of safety services, Allis-Chalmers Manufacturing Company, Milwaukee, first vice president;

Edwin B. Locke, manager, Engineering Department, Texas Employers Insurance Association, Dallas, second vice president;

A. C. Blackman, managing director, American Society of Safety Engineers, Chicago, secretary; and

Frank E. Laderer, director of safety, Nationwide Insurance, Columbus, treasurer.

ASSE Special Committee On Junior Achievement

The first meeting of the Special Committee on Junior Achievement under the auspices of the American Society of Safety Engineers was held recently at the American Optical Company. The committee discussed awards and honors for Junior Achievers and studied standards to be used as a guide for A.S.S.E. Junior Achievement activities throughout the country. The committee includes, from left (seated), Gerald Van Steenburgh, Travelers' Insurance Co.; Chairman Charles G. Albrecht, American Optical Co.; Edward N. Deck, General Electric Co.; (standing) Carleton R. Reid, Westinghouse Electric (retired); Arthur G. Lazarus, Liberty Mutual Insurance Co.; and Otto J. Nowak, New York Telephone Co. Missing from the photograph is Edward V. McKeon, Wyman-Gordon Co.

Safety Does Save!

A Nashville, Tenn. scrap firm has received reductions in its credit ratings on compensation insurance over a six-year period of 22 to 36 percent—about $1,000 a year—below the manual rate because of their plant safety program, reports the Institute of Scrap Iron & Steel in a Safety Management Brief.

The head of the firm states "We have found a safety program is not a fly-by-night, hit-or-miss situation. You must continue to demonstrate to your employees the eventual value to all concerned."

As the first step, the firm advanced its plant superintendent to the post of Safety Superintendent and made him responsible for the entire conduct of the program, both in the plant and among the truck drivers in the company fleet. His duties include safety surveys, analysis of work procedures, lectures and co-operating with the insurance company's safety engineer in planning and operating the program. Considerable use is made of Institute safety materials, the company reports. It also notes that the firm's success can be attributed to management's willingness to conduct a continuing, long-range program and the naming of a single individual to supervise the campaign.

POSITION AVAILABLE

SAFETY ENGINEER

Los Alamos Scientific Laboratory, located high in the mountains of northern New Mexico and operated by the University of California, has an opening for a safety engineer. Applicant must have a bachelor's degree in engineering or chemistry, plus at least two or three years of general safety experience similar to that obtained through insurance company work. Please send resume to Recruiting Department, Los Alamos Scientific Laboratory, P.O. Box 1663, Los Alamos, N. M.

(An Equal Opportunity Employer)

Safety Supervisor's Course

A short course for Safety Supervisors will be offered by the Engineering Extension Service of Texas A & M College on January 29 through February 2nd. The course, given periodically, is open to anyone responsible for setting up and conducting accident prevention programs. It is designed to train persons new to the safety field and to bring experienced safety engineers up to date on new promotion techniques. Instruction will be given by the regular Supervisor Training Instructors at the Engineering Extension Service. The registration fee is $50 and accommodations are available at moderate cost. Concurrently, a General Course in Supervision is also being presented. For details, write to: L. K. Jonas, Chief, Supervisory Development Div., Engineering Extension Service, Texas A & M College System, Box 236 F. E., College Station, Tex.

Maytag Goes Specific In Safety Program

The safety department of the Maytag Company, Newton, Iowa, has prepared individual safety rules pamphlets for each department in the manufacturing division, as well as a general safety rules booklet. Each employee gets a copy of both the general booklet and the specific one for his department. When transferred, he receives a copy of the safety rules covering his new assignment. A total of 20 separate departmental booklets have been issued and a similar pamphlet is being prepared for office personnel.

WHAT'S THE LAW?

Edited by HENRY M. GROSMAN
Counselor at Law, Newark, N. J.

MEMBER . . . . . .
Master Superior Court, New Jersey American Bar Ass'n, New Jersey Bar Ass'n, Chairman, Committee on Workmen's Compensation, New Jersey Bar Association National Federation Insurance Counsel Past Commander, American Legion, Post 10, ... Newark, N. J.

EMPLOYMENT RELATIONSHIP—Employee or Independent Contractor—Findings of Fact

Claimant was an ice cream salesman. He drove a company truck along a route provided by the company. He was not paid a salary, nor was he carried on the books as an employee. No social security, withholding tax or unemployment compensation deductions were taken or recorded. He was, in effect, on his own as to the manner of selling ice cream while on the route, but could have been discharged by the company by refusing credit, which was granted to him on a day-to-day basis. He kept the difference between the price he paid for the ice cream and the sales price. The trial court found that the claimant was an independent contractor rather than an employee, and therefore not entitled to workmen's compensation. This court said that the fact that the company had workmen's compensation insurance did not mean the claimant was necessarily an employee. Affirmed.

Stewart vs. Bakers Ice Cream Co., Inc.; Alabama Supreme Court, 6 Div. 565. May 11th, 1961.

MEDICAL TREATMENT—Necessary Drugs—Authorization of Doctor

Claimant seeks to recover the cost of drugs he purchased in connection with a compensable back injury. He submitted two bills, one an itemized statement for $244 and one a general bill for $150, to the carrier for payment. Payment was refused for all but $27.90. It is necessary that a claimant show that any drugs taken were either prescribed by an attending doctor or taken under the direction and supervision of a qualified physician. The reason for this rule is that it takes the issue of whether the drugs are necessary out of the hands of both claimant and carrier, and puts it in the hands of a qualified doctor. The claimant in this case did not show that anything more than 48 tablets of Darvan, a pain killer, was prescribed by his doctor. The doctor testified to the effect that that was all he had prescribed. This court said that claimant must show more than just the fact that he spent money on drugs; he must show that this spending was warranted. This court quashed the order of the Commission and remanded for further proceedings to give claimant a chance to prove the necessity of the drugs. Reversed.

Board of County Commissioners vs. McLain; Florida Supreme Court, No. 30, 880. May 5th, 1961.

TRAUMATIC INJURY BY ACCIDENT—Definition of Terms—Partial Disability

A laborer in defendant's plant suffered a sharp pain in his abdomen while attempting to lift a heavy steel rail. He went to a restroom feeling weak, and discovered that he was passing blood. Upon examination by two doctors, it was determined that an injury to the bowel had caused the bleeding. One doctor said it was due to the rupture of a varicose vein, caused by the heavy lifting, while the other said it was due to the presence of herniation through the walls of the bowel, the cause of which is unknown. Both doctors agreed, however, that plaintiff was permanently disabled to the extent of performing any heavy manual labor. In de-

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(For details, use Key # L-6 on card on page 19)

termining the definitions of the word "accidental" and "traumatic," the court held that "accidental" means that there is medical testimony that the strain of the employee's work-connected exertion caused him bodily harm. It is not limited to either accidental cause or accidental result. The term "truamatic" applied to any injury caused by a work-connected external force. The award for a traumatic injury by accident was proper. Affirmed.

North American Refractories Co. vs. Jackson; Kentucky Court of Appeals. April 28th, 1961.

BURNS—Pre-Existing Back Injury Aggravated—Extent of Disability

An employee, seriously burned when his clothes caught fire, was awarded compensation for total and permanent disability. The insurance carrier contended that there was no evidence of the employee's injuries extending to or affecting other portions of the body and, therefore, the finding of total and permanent disability was against the overwhelming weight of the evidence. The court held that while the burns were concentrated in the area of the left leg and arm, it had aggravated a pre-existing back and sciatic nerve injury. The aggravated back injury had resulted in a general nervous condition. None of the injuries were confined to the specific areas, and all exerted a disabling effect on him which rendered the employee totally and permanently disabled from doing manual work. Affirmed.

Aetna Casualty & Surety Co. vs. Finney; Texas Court of Civil Appeals, No. 7303. May 16th, 1961.

HERNIATED CERVICAL DISC—Twisting, Reaching and Stretching—Causal Relationship—Substantial Medical and Expert Testimony

An X-ray file clerk was properly awarded compensation for a herniated cervical disc caused while performing her work. Claimant was required to lift objects, push a cart, file and other associated duties, many of which required twisting the body, reaching and stretching. Medical and expert testimony established causal relationship; that the nature of the duties required of the claimant were such as to cause the disc condition. The court held here was substantial testimony to support the board's finding and award for claimant. Affirmed.

Mullarkey vs. New York Hospital; New York Supreme Court, Appellate Division, Third Judicial Department. No. 2897. March 9th, 1961.

Stairway Falls

Slipping accounts for more stairway falls than any other cause, according to Merle Esmay, argicultural engineer at Michigan State University. The statement was based on a survey made of 101 persons who recently were injured in stairway falls. More than half of those interviewed stated that they were in a hurry, or that their arms were full when they took the toss, according to Esmay. Other reasons given included stocking feet, slippers, wet and slippery feet, high heels, temporary distraction, poor stairs, poor lighting, or loose stair treads or covering.

In an effort to assist manufacturers to design safer stairs, Mr. Esmay and two of his graduate students tested different tread materials and shoe sole materials to determine their relative slipping and non-slipping ability.

Leather soles on linoleum treads were the most dangerous, while corrugated rubber soles on abrasive strips were the safest, according to Esmay's results. Abrasive strips were the most slip-resistant with both new and worn shoe sole materials.

Second Quarter Injury Rates Low

The all-manufacturing injury-frequency rate for the second quarter of 1961 matched the previous low for that period, which was achieved in 1958. The rate of 10.5 disabling injuries per million man-hours worked was 5 percent lower than the rate for the same quarter last year but was a fraction above the first quarter of 1961, according to preliminary data compiled by the U. S. Department of Labor's Bureau of Labor Statistics.

The monthly rate decreased from 10.2 in March to 9.8 in April, but this was followed by a greater-than-seasonal rise to 10.5 in May and 11.0 in June. While the June rate was exactly the same as last year's, it was 3 percent higher than June of 1958.

The first six months of 1961 produced a rate of 10.4—the best six-month average recorded and 6 percent lower than 1960. If this low incidence of injuries can be maintained, 1961 could be the best year on record. However, the greater-than-seasonal increases in May and June could indicate a rising trend resulting from increased industrial activity. Previous experience suggests that increased industrial activity is followed by an increase in injury rates.

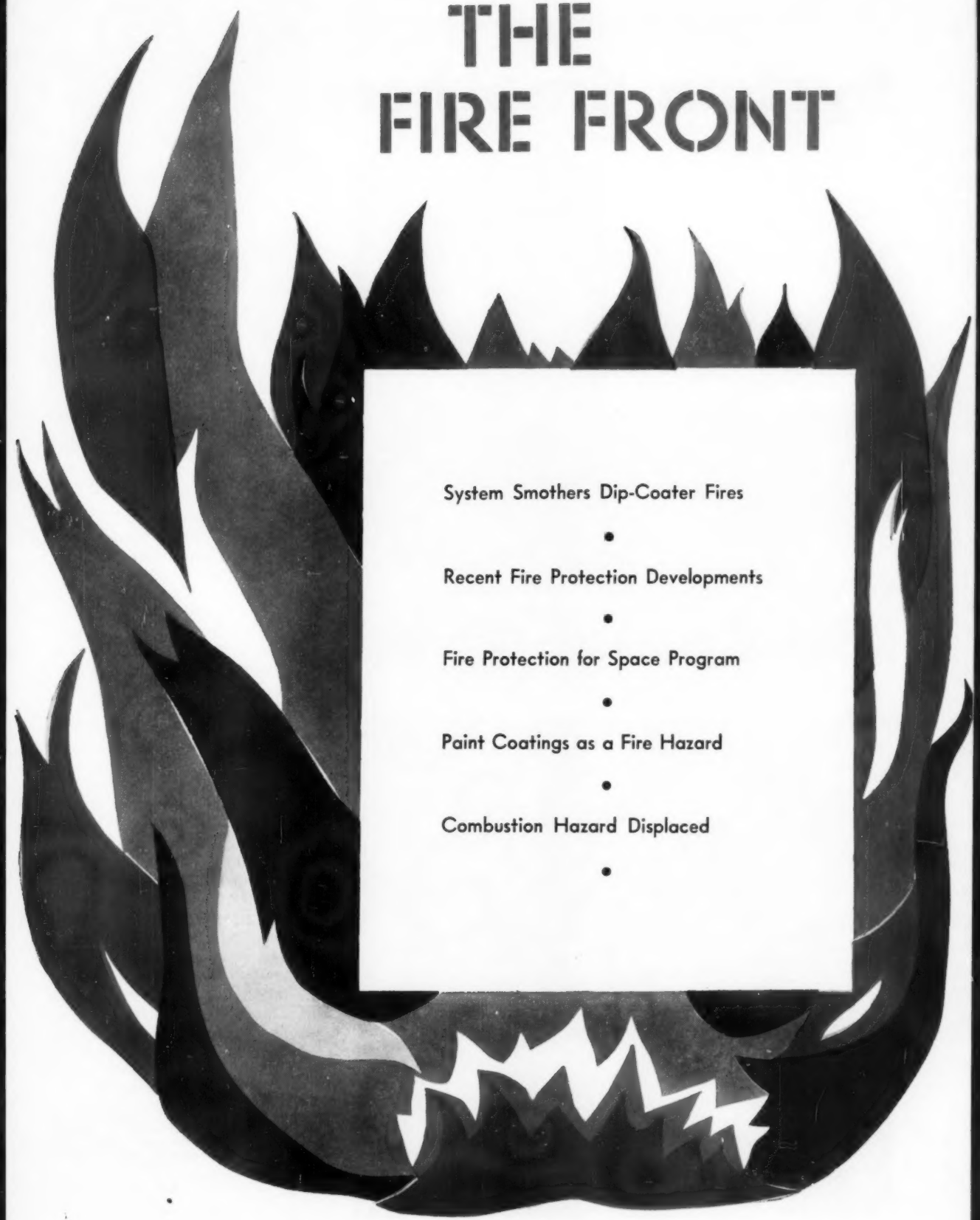
Of the 132 industry classifications for which comparable quarterly data are available, 69 showed changes of less than 1 full frequency-rate point; 30 industries increased from 1 to 5 points while 25 decreased by the same amount. Only 3 industries had increases of 5 points or more; while 5 decreased by the same margin.

The rate for the logging industry increased over the first quarter by 7.8 frequency points; boat building and repairing, by 7.2; miscellaneous leather products, by 5.9; and structural clay products by 5.9 frequency-rate points.

The rate for the metal household furniture industry decreased from the first quarter by 6.5 frequency points; compressed and liquefied gases, by 6.4; fabricated plastics products, by 6.0; miscellaneous wood products, by 5.7; and the fertilizer industry by 5.3.

The electric lamp (bulb) industry holds the best record for the second quarter of 1961, with a rate of only 1.2 injuries per million manhours worked. The synthetic rubber and scientific instruments classifications produced the next best records—1.5 and 1.6 respectively. A total of 25 industries reported injury-frequency rates of less than 5.

THE FIRE FRONT



System Smothers Dip-Coater Fires

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Recent Fire Protection Developments

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Fire Protection for Space Program

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Paint Coatings as a Fire Hazard

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Combustion Hazard Displaced

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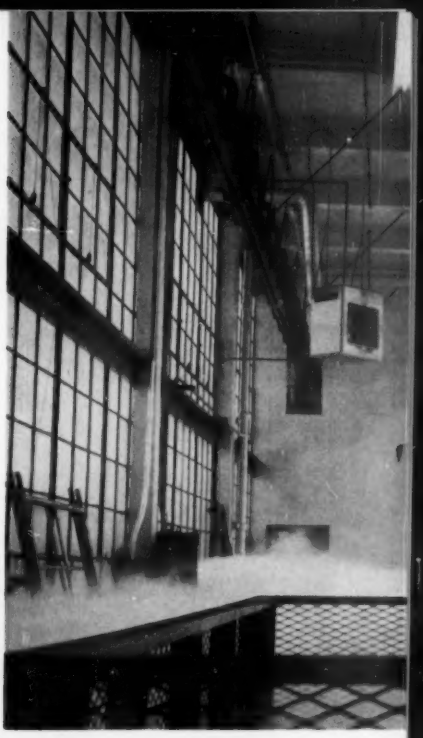
System Smothers



Williamsburg Steel's manager, Jack Schwartzenburg, points to strategically located multi-jet carbon dioxide nozzle.

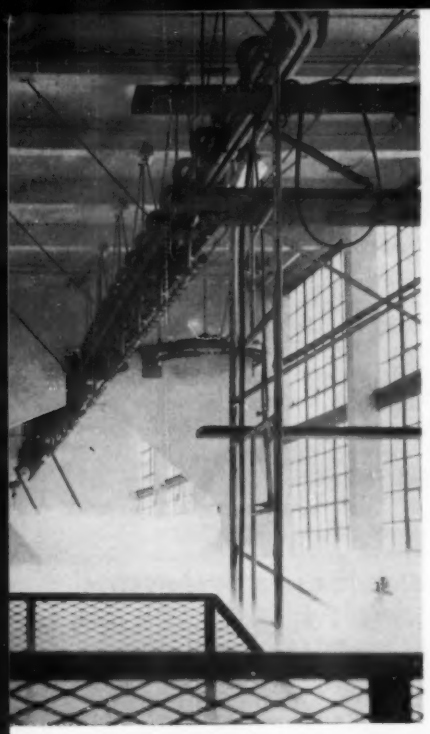
Dip-Coater Fires

How do you protect a vital piece of production equipment employing flammable liquids against damage and down time as the result of fire? Williamsburg Steel Products Co. of New York City licked the problem on its new $125,000 dip-coating machine and drier with the installation of an automatic carbon dioxide fire extinguishing system.

Williamsburg Steel uses the 63′ x 23′ coater to paint steel door frames with a high-flash-point, naphtha-base solvent. Frames pass into the coater on a conveyor, are painted, and pass through a gas-fired drying oven at a maximum rate of 120 units an hour.

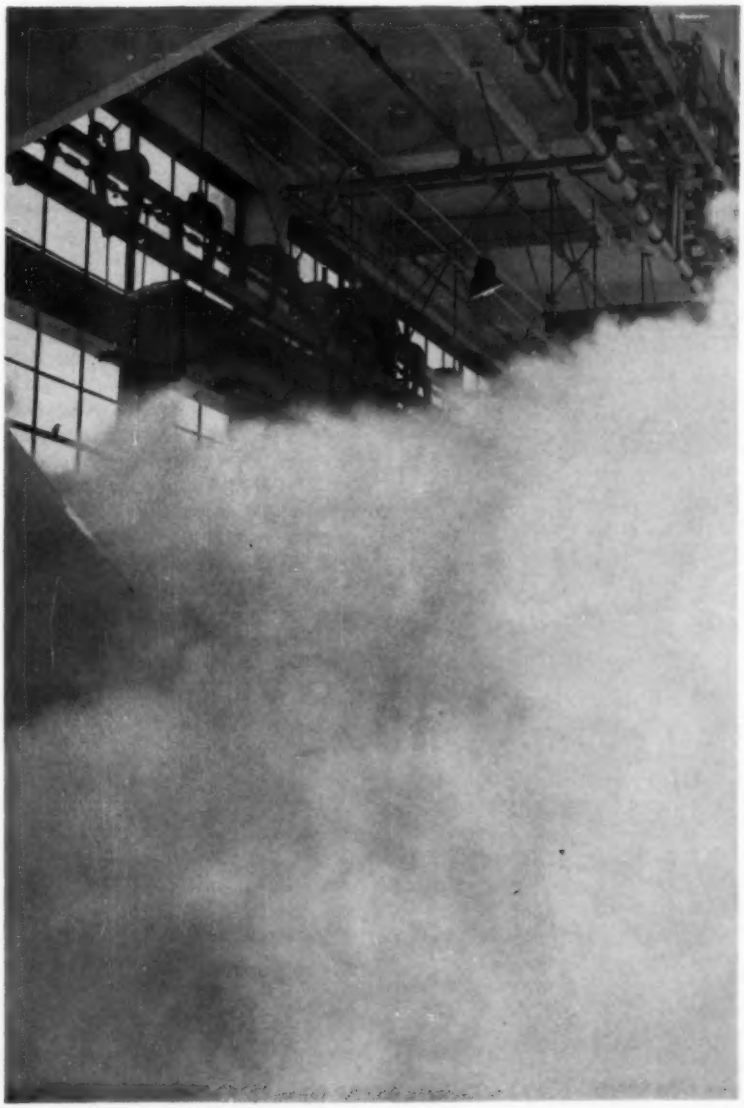
Although fire safety precautions such as explosion-proof electrical equipment, grounded machinery, and high velocity exhaust blowers are inherent to the installation, the presence of 4,800 gallons of flammable liquid and the accumulation of vapors are always potential trouble makers. However, if fire

Insurance engineer checks operation of dip coater system's time delay during test. Device triggers area alarms and delays CO^2 discharge for sixty seconds.



Within ten seconds after the start of discharge, carbon dioxide completely blankets the dip coater and drain area.

Thirty seconds after discharge, the fire smothering extinguishment has almost completely inerted the entire room.



flashes, the carbon dioxide system takes over. Here's how the system works.

Temperature-rate-of-rise fire detectors are strategically located throughout the coater and drying area. If fire flashes, almost simultaneously they trigger thirty-one 75-pound cylinders of fire-smothering carbon dioxide located nearby. Under its own pressure the fire smothering gas passes through piping to the coater-drier where it discharges from jet nozzles. A sufficient volume of carbon dioxide is introduced to envelop completely the entire assembly.

A pressure-operated time-delay alarm assembly is built into the piping upstream of the first discharge nozzle. When the system actuates, it causes an alarm to sound and delays passage of the gas for sixty seconds, a sufficient period to permit personnel to evacuate the area.

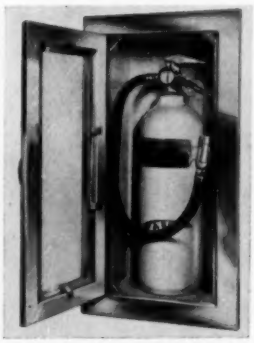
Also built into the system are pressure-operated switches and trips. Operation of the fire extinguishing system causes them to open the paint dump valve, close two doors into the area and the damper in the exhaust duct, and secure power for the coater and its conveyor.

Williamsburg Steel's Jack Schwartzenberg, Manager, states

(Continued on page 62)

KEEPING UP WITH

FIRE PROTECTION SERIES
Part 3
other articles Sept. and Oct.



TRIPLE SERVICE EXTINGUISHER AND CABINET

New triple-service Fyr-Fyter All-Purpose Dry Chemical Fire Extinguisher, now available for built-in wall cabinet installation, serves as complete fire control center. The one extinguisher is U.L. and F.M. approved for combatting "all" classes of fire: general combustible, burning liquid and electrical fires. The high capacity 20-lb. extinguisher is sized for neat, uncrowded installation in Fyr-Fyter Model 480 cabinets. Optional cabinet features include: steel, stainless steel or aluminum trim; flat or projecting trim; choice of several door styles; one-piece or two-piece construction. Cabinets can be furnished in all standard dimensions or custom built to specification.

For details, use **Key #FP-1** on inquiry card on page 19.

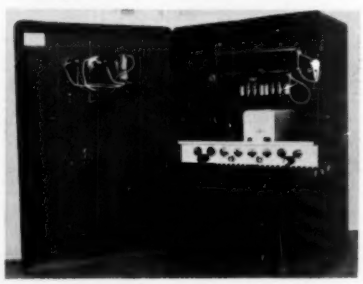
CONCEALED FIRE ESCAPE

A concealed fire escape that looks like a drain pipe is available for two and three story structures, such as small plants, schools, hospitals, dwellings, etc. "Safe-X-Scape," can be mounted outside any upstairs window on any building. At the flip of a catch, the "drainpipe" folds out into a full sized sturdy aluminum ladder which will support 2,000 pounds. The ladder cannot be opened from the ground; only from the second or third story window. Unit is made by Win-Chek Industries.

For details, use **Key # FP-2** on inquiry card on page 19.

SMALL PLANT ALARM SYSTEM

Notifier Corp., announces its new U.L. listed CAFP-1 panel, designed to meet specifications which require a 120 volt A. C. fire alarm system. The panel is suitable for protection of small plants, schools, dormitories, nursing homes, and similar properties where an alarm on the local premises is sufficient. However, terminals are provided for an auxiliary trip panel to transmit alarm signals to a remote station.



The CAFP-1 system basically consists of a single supervised signal-initiating circuit, common control equipment, an electrically supervised alarm bell line, for 1 to 10 12-volt bells, and a trouble bell line. It uses one standard 120 volt A. C. 60 cycle current source for system operating power, and another such source for trouble power. It is designed always to give a trouble signal in event of an "open" or a "ground," without a false alarm in the operating circuits. Coded manual stations allow local coded alarm operation. All relay equipment is sealed in dust-proof, tamper-proof, metal plug-in units carrying a five-year warranty.

For details, use **Key # FP-3** on inquiry card on page 19.

FIRE PROTECTION DEVELOPMENTS

IMPROVED BACK-PACK PUMP

The new Indian, back-pack tank extinguisher made by D. B. Smith & Co. has a newly designed hand pump that can be snapped to the carrying strap. Within easy and quick reach when not in use, it leaves arms free. The improved pump is shorter (about 18") but provides full volume capacity. The comfortable telescoping handle permits compact storage. 90 degree angle elbow outlet prevents kinking of hose. Tank holds 5-gallons of water.

For details, use **Key # FP-4** on inquiry card on page 19.

FOAM NOZZLES ON WHEELS

Mobile foam nozzles are a new advance in foam-fighting developed by National Foam System, Inc. Aer-O-Foam PW-50 Variable Spray Nozzle is mounted on a two-wheeled running gear equipped with a drawbar for hitching to a foam truck or car. Hand grips aid maneuverability; the unit is light—can be moved by one man. Cylindrical container under nozzle is for stowage of hose. Handles for control of stream direction are adjustable to the operator's comfort, regardless of angle of elevation; or they can be secured in the ground,

holding the nozzle in a stationary position. The unit can throw a foam or water stream up to 225 feet. With nozzle pressure of 150 psi, straight foam stream up to 4000 gallons per minute can reach heights of 50 feet. Spray control permits ten variations in pattern between full spray and straight stream.

For details, use **Key # FP-5** on inquiry card on page 19.

NEW CARBON DIOXIDE UNITS

A hand-portable fire extinguisher that can be easily operated is a new product of the Cardox Division of Chemetron Corp. The new carbon dioxide unit comes in five models. Ratings given by the Underwriters' Laboratories, Inc. are 4BC, 8BC, 10BC, 12BC, and 12BC (CQ) for the Cardox models with capacities of 5, 10, 12, 15 and 20 pounds of carbon dioxide. Suitable for fires in flammable liquids or electrical equipment, the new extinguishers have patented designs to achieve correct rate of discharge and the right size of "snow" particles, and eliminate turbulence, the company said.

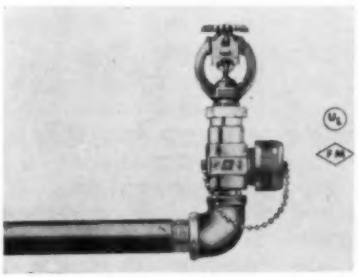
For details, use **Key # FP-6** on inquiry card on page 19.

FLAMMABLE LIQUID DISPENSER

A new mobile safety dispenser for flammable liquids recently introduced by The Protectoseal Co.,

saves time and labor in refilling safety cans, wash tanks, bench cans, etc., at their job locations. The unit incorporates a special flammable liquid transfer pump fitted with a 6 ft. neoprene hose which has a sealed-in static grounding wire to prevent static buildup during transfer operations. Vacuum breaker mechanism in the pump instantly shuts off liquid flow and prevents spillage. Handles up to 5 gallons per minute from the 60-gallon steel tank, which is internally baffled to prevent liquid surge when the unit is moved. Hand brake ensures positive braking action. Liquid level is indicated by a magnetic gauge. Unit has a sturdy front bumper and a handle for easy mobility. Fill opening has a special combination flame arrester-pressure relief fitting. U.L. listed.

For details, use **Key # FP-7** on inquiry card on page 19.



SPRINKLER LINE TESTERS

Seco Line-Testers are now offered in a new model incorporating several major design changes. The new model #445 is now approved by both U.L. and F.M. Installed in either new or existing systems, the line testers provide a quick, convenient, and low-cost means of flow-testing sprinkler branch lines. Such flow-tests are necessary to determine the condition of the lines and are part of approved sprinkler maintenance procedures. Simply by removing the side outlet cap, connecting a hose and turning the hex head to "open" position, a flow-test can be made.

For details, use **Key # FP-8** on inquiry card on page 19.

TWO DRY CHEMICALS

Two new pressurized models of dry chemical fire extinguishers have been developed by M. L. Snyder & Son for use on fires involving electrical equipment and fires in flammable liquids. Both units are listed or approved by U.L., F.M., U. S. Coast Guard, and I.C.C. The 2¾-lb. Model 503 has a 6 B:C rating, packing a lot of power for its small size; and the 5-lb. Model 505 rates 8 B:C. Units are particularly suitable for boats and vehicles as well as plants and homes. Design features one-hand operation; dial shows pressure; powder will not cake.

For details, use **Key # FP-9** on inquiry card on page 19.

SELF-CONTAINED FIRE ALARM

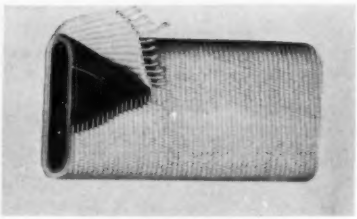
The Reddi-Eye Automatic Fire Alarm, made by Standard Fire Alarm & Signal, Inc., is now available in a compact, attractive, self-contained unit that provides constant fire detection and warning for small plants, homes, offices, stores, motels, etc. When temperature indicates possible fire danger, it sounds a 12 to 15 minute sleep-shattering blast. U.L. listed unit is rugged, fully guaranteed, maintenance-free and is available in several colors. It is activated by du Pont Freon, and the glass-eye visual monitor indicates liquid Freon level in the cylinder. Electricity, batteries and all outside sources of power are eliminated. Available in a 136°F rating for use where normal temperatures do not normally exceed 100°F, and in a 174°F rating where normal temperatures exceed 100°F.

For details, use **Key # FP-10** on inquiry card on page 19.

STORAGE TANK BREATHER VALVE IS FREEZE RESISTANT

A new, freeze-resistant All-Weather Breather Valve, made by Varec, Inc., has completed a two-year test on benzene tanks in Sidney, Nova Scotia. It performed perfectly under extreme weather conditions with a product that froze at between 36° and 38°F. In addition, the valve worked equally well during hot, humid summer weather. This new Varec breather valve uses, on both pressure and vacuum pallets, a flexible diaphragm of special non-frosting and icing-resistant material. This prevents pallets freezing closed and assures vapor tightness. A non-frosting and icing-resisistant compound is applied to the pallet perimeter and stem, guide posts and tip of seat ring. Inspection and maintenance are simplified by a "flip-top" cover which is quickly released by twisting two spring-loaded release handles.

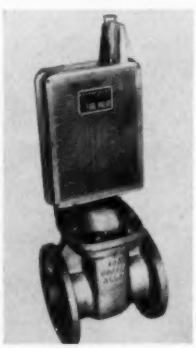
For details, use **Key # FP-11** on inquiry card on page 19.



LINED FIRE HOSES

New Reel King and Reel Queen Fire Hose are designed to get into action fast and supply full, dependable service with full water pressure. Light, compact, and easy to use, these fabric-covered, neoprene-tubed hoses do not weep, can perform heavy service better than unlined hose and withstand deterioration prevalent in industrial plants. U.L. and F.M. approved. Reel King with its all-polyester jacket assures extra durability, lightness and flexibility, as well as excellent resistance to abrasion, mildew, and chemicals. Reel Queen Fire Hose with a cotton-polyester jacket provides exceptional strength without bulk, and gives long and efficient protection. Made by Boston Woven Hose & Rubber Co., Div. of American Biltrite Rubber.

For details, use **Key # FP-12** on inquiry card on page 19.



CUTOFF VALVE FOR FLAMMABLES

A new fire protection cutoff valve with no counterweights nor interior bellows has been developed by the Valve & Fitting Div., Cooper Alloy Corp. The stainless steel valve is a bolted-bonnet gate valve held open against two stainless steel springs by a fusible link. At a preselected temperature the link melts allowing the springs to

snap the valve shut. The action is used to shut off the flow of flammable liquid to fire areas. May be installed in any position and in minimum space. Available in sizes from ½ to 6 inches for up to 150-lb. working pressure and with links of various ratings.

For details, use **Key # FP-13** on inquiry card on page 19.

IMPROVED SMOKER STANDS

All crinkle finished models in the Sipco Dunking Station Line manufactured by Standard Industrial Products Co. now have a smooth satin finish on the canister lids. In addition to presenting a more pleasing duo-tone appearance, the smooth surface is easier to clean, since cigarette ashes cannot become imbedded.

For details, use **Key # FP-14** on inquiry card on page 19.

TRI-CLASS ABC EXTINGUISHERS

New 10- and 20-lb. portable extinguishers, for use on all three kinds of fire (Class A—wood, paper, cloth, etc.; Class B—flammable liquid; Class C—electrical) have been introduced by Walter Kidde & Company, Inc. They bear U.L. ratings of 2-A, 16-B:C, and 3-A, 20-B:C respectively. Approved for non-metallic fire hazards, Kidde Tri-Class-ABC units simplify training of personnel. No possibility of error in matching extinguisher to hazard. Simple recharging means that units are quickly returned to service. Also approved by F.M.

For details, use **Key # FP-15** on inquiry card on page 19.

SPLIT SECOND SAFETY
Model 7300
Cast aluminum receptor; twin fountain heads direct automatically regulated streams into the eyes.
PUSH TO OPERATE
Haws

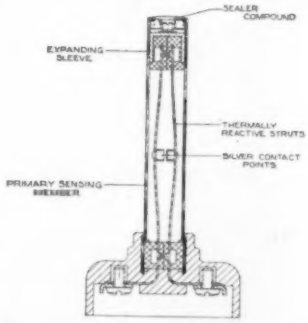
EMERGENCY EYE-WASH

Sensitive eye tissue can be destroyed in moments. Contamination from industrial caustics and chemicals requires instant first aid . . . and a HAWS Emergency Eye-Wash Fountain can mean the difference between temporary irritation and permanent injury! Write for your free HAWS catalog.

Since 1909 HAWS EYE-WASH FOUNTAINS

a product of HAWS DRINKING FAUCET COMPANY 1443 Fourth St., Berkeley 10, Calif.

(For details, use Key # L-7 on inquiry card on page 19)



QUICK RESPONSE DETECTOR

Thermotec Model 302 thermostat increases the efficiency of fire detection installations because of its unusual sensitivity and its ability to sort out normal temperature changes from actual fire conditions, according to the manufacturer, Tomorrow, Inc. The new fire detector thermostat, listed by U.L., can be used as a replacement element in present systems in order to modernize them or as an element in new installations. Due to its unusual design, the unit is relatively unaffected by moisture, dust, vibration and even paint build-up.

For details, use **Key # FP-16** on inquiry card on page 19.

INFRA-RED FIRE DETECTION SYSTEM

Automatic Sprinkler Corp. of America has developed a new fire protection system for safeguarding machinery operations on solid-fuel missile propellants. Using infra-red detection equipment, the system "sees" the first warmth from a fire—radiation from the first stages of decomposition from which a fire breaks out. The signal, amplified, detonates a tiny quantity of powder at the deluge valve and this miniature explosion triggers a water deluge on the protected machine.

For details, use **Key # FP-17** on inquiry card on page 19.

FULL LINE OF MULTIPLE PURPOSE EXTINGUISHERS

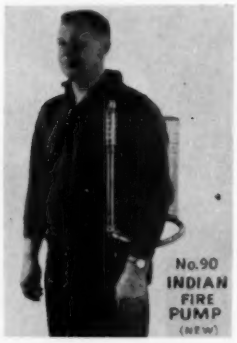
A new dry chemical extinguishing agent, effective on Class A, B and C fires, has been introduced by Ansul Chemical Co. "FORAY" is the first multi-purpose dry chemical to be offered in a complete line of hand units. Available in cartridge or stored-pressure 8½, 17 and 25 lb. models for flammable liquid, electrical, and ordinary combustible fires. Conversion kits adapt most Ansul hand portable extinguishers now in service to the use of "FORAY" dry chemical. With high U.L. ratings for the powder agent, the 8½ lb. model is the smallest amount of dry chemical to be granted a rating by U.L. for Class A fires.

For details, use **Key # FP-18** on inquiry card on page 19.

TIN DIPPED SAFETY CANS

As a service to factories, hospitals and laboratories where increasing amounts of flammable solvents are being handled, several sizes of hot-tin dipped safety cans have been added to the Justrite line of approved safety cans. The tinned surface provides a cleaner container for solvents and greater resistance to corrosion. The cans have a coating of pure tin on the interior and on the exterior. Regularly furnished unpainted to prevent their being confused with standard types of safety cans. Each has a cast, malleable spout with pouring lip, reinforced body construction, easy-to-operate handle assembly, and the individual U.L. label. Available in 6 sizes from one quart to five gallons.

For details, use **Key # FP-19** on inquiry card on page 19.



IMPROVED PUMP EXTINGUISHERS

Miller-Peerless Mfg. Co. has announced an anti-corrosion process in the manufacturing of their 2½- and 5-gallon pump tank fire extinguishers. The tanks are now hot-dip galvanized after forming for longer life. Units are designed for all-year operation when anti-freeze charge is used in place of the usual water.

For details, use **Key # FP-20** on inquiry card on page 19.

MOBILE FIRE TANK

Baughman Mfg. Co. has introduced a new and improved version of the Baughman Fire Tanker which carries its own water supply and operates without connection to fire plugs. Designed for small towns, rural areas, and isolated plants, or as a second unit for larger communities, the truck can pump water while still in motion. Water is delivered at 200 gallons per minute from a 1500-gallon tank. Adjustable nozzle produces a solid stream, conical fog pattern, fine spray or jet stream. The hose reel retracts automatically at the push of a button. Standard equipment includes rotating beacon, siren, self-priming pump, suction hose and strainer, fire extinguishers, one 1" and two 1½" hose lines.

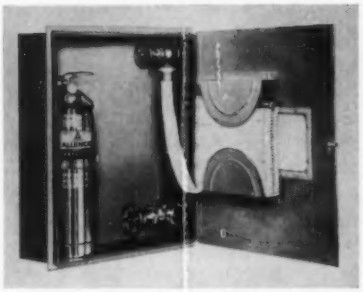
For details, use **Key # FP-21** on inquiry card on page 19.

FLAMMABLES HAND PUMP

Tokheim Corp. has introduced a new lower cost high-vacuum, hand pump for petroleum products, with a horizontal counter. The new

Series 588 delivers on both forward and back strokes, but operates with one instead of two diaphragms. It pumps up to 15 gallons per 100 strokes, and is built to withstand rugged farm or industrial use. Counting mechanism is calibrated to the pump stroke, counts up to 100 gallons per fill and totalizes up to 10 thousand gallons. A variety of models feature a flexible diaphragm of tough, molded synthetic; stainless steel valve assemblies; vacuum breaker; self-venting bung adaptor; self-adjusting suction pipe and removable suction screen. Both hose and spout models available for drums, skid tanks and underground tanks. Foot valve with built-in adaptor is installed directly to sliding suction pipe.

For details, use **Key # FP-22** on inquiry card on page 19.



TRIMLESS FIRE CABINETS CUT SPACE REQUIREMENTS

Requiring 35% less area than other cabinets, trimless Hozegard fire cabinets, available from W. D. Allen Mfg. Co., install on any plane. Flush mounting and elimination of trim reduce the exposed portion to the size of the door.

The new units feature knockouts for installation of 2½ inch angle valves and include hose racks mounted on the door instead of inside the cabinet. These racks accommodate from 25 to 100 feet of regular linen or cotton rubber lined fire hose. An exclusive hose clip makes the Allenco cabinet semi-automatic, for one-man operation. When equipped with this clip, the entire unit is 100% UL listed. Available in steel, aluminum, stainless or bronze.

For details, use **Key # FP-23** on inquiry card on page 19.

(For details, use Key # L-8 on inquiry card on page 19)

ALL-USE DRY CHEMICAL FIRE EXTINGUISHERS

American LaFrance announces two models of a new All-Use dry chemical fire extinguisher for industrial, commercial, farm and marine fire protection. 10 pound, P-10, has UL ratings of 1A:16B:C. The 20 pound unit, Model P-20, has added capacity, higher ratings for protection of larger risks. The new patented dry chemical powder, when discharged from the pressurized extinguisher, provides a dense atmosphere that smothers A, B or C class fires.

For details, use **Key # FP-24** on inquiry card on page 19.

PORTABLE FIRE PUMP & TANK

A self-contained, 200-gallon fire-fighting unit for a small truck or trailer has been announced by Fire Equipment, Inc. The unit brings low-cost, immediately-available fire protection to industrial concerns, lumbering and forestry camps, and others in relatively inaccessible areas. The "Fire Master" Slip-On Pumper, has a water tank with corrosion resistant coating, a reliable gasoline-powered pump, hose reel with 50 feet of hose, and a combination spray-fog nozzle. It can project an 85-foot stream at 100 pounds pressure, giving 11 minutes continuous operation. An auxiliary suction port permits pumping from ponds, wells, streams, etc.

For details, use **Key # FP-25** on inquiry card on page 19.

OIL SLICK ANTIDOTE

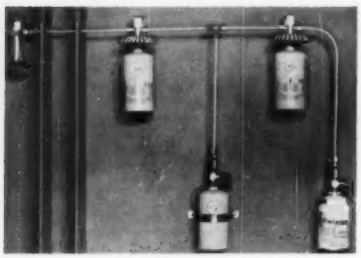
A new product by Conco Chemical Company disperses oil slicks instantly by chemical action. Conco LCP-12 was designed to combat the oil slick problem in fresh or salt water. Used as a spray after slick appears, or injected at source. Stored at ship channels, ports and docks to combat slicks and oil fires, it disintegrates oil slicks, leaving nothing to burn. Large slicks (one or more square miles) may be sprayed with fire hose or by plane.

For details, use **Key # FP-26** on inquiry card on page 19.

ICC APPROVED DRY CHEMICAL

An Underwriters' Laboratories approved 2½ lb. pressurized dry chemical fire extinguisher equipped with a gauge or similar device has full approval of the Interstate Commerce Commission to be carried by buses, trucks and truck tractors. The Fyr-Fyter Company's recently improved gauge-type 2½ lb. "Safety Twin" extinguisher complies with the new ICC requirements. It has a 4 B:C rating for both flammable liquid and electrical fires, and is solidly constructed to take vibration and rough abuse. Measuring 14½" high and weighing 6 lbs., unit has carrier-style clamp mounting bracket.

For details, use **Key # FP-27** on inquiry card on page 19.



APPROVED NON-ELECTRIC FIRE ALARM SYSTEM

Falcon Alarm Co., Inc., has announced that the company's automatic gas-operated fire alarms have recently been listed by both Underwriters' Laboratories, Inc., of the U.S.A. and Underwriters' Laboratories of Canada, Inc., for use with 600 ft. of ¼" aluminum tubing. This new listing permits location of the Falcon detector in remote critical areas up to 600 ft. from the warning horn itself. One or more detectors may be connected with the tubing to the warning horn. Manually operated units may be connected into the line to allow testing, fire drills, etc. Falcon Alarms require no wiring or batteries. They are completely self-contained and Freon-powered. A sight glass permits visual determination of the level of the propellant.

For details, use **Key # FP-28** on inquiry card on page 19.

FIRE MUFFLER

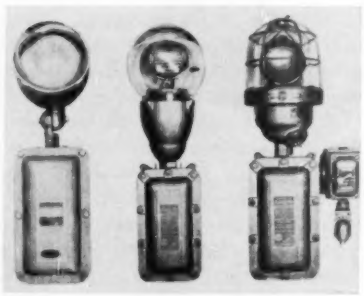
Janos Asbestos Co. is utilizing the fire resistant properties of asbestos in a blanket to smother fires in industry or the home. The Fire Muffler unit is contained in a red metal canister, which has a metal loop for easy attachment to walls or accessible surface. The 5′ x 5′ asbestos fire muffler is easily removed by grasping the finger loop on tip of blanket as shown in the picture. The Fire Muffler will never burn nor wear out—no refills needed. It is easy to use and effective for smothering small fires, including burning clothing.

For details, use **Key # FP-29** on inquiry card on page 19.

COMPACT FIRE EXTINGUISHERS

Fast, dependable fire protection for homes, autos, boats or any similar location is available with the new compact Merrimac extinguisher made by Ansul Chemical Co. An easy-to-operate cylindrical extinguisher with a replaceable shell, it is listed by U.L. and also approved by the U. S. Coast Guard. The Merrimac continues Ansul's original "spare" idea for recharging extinguishers, first-introduced with the ball-shaped Monitor extinguisher. For either extinguisher, the empty shell can be unscrewed and replaced. Designed for one-hand operation, full-grip triggers prevent slipping of hands or fingers. Both units have red plastic seals which warn of discharge or tampering. Both contain 2¾ lbs. of dry chemical, have 4 B:C ratings.

For details, use **Key # FP-30** on inquiry card on page 19.



AUTOMATIC EMERGENCY LIGHTS FOR HAZARDOUS LOCATIONS

Carpenter Mfg. Co. announces its line of Watchmaster emergency lights for hazardous locations. Explosion-proof, dust-tight and vapor-tight models are available, powered by a self-contained dry battery pack. The battery, automatic relay and lamp switch are enclosed in a specially sealed cast aluminum housing. Entire unit can be mounted within the hazardous area.

The Watchmaster lights provide illumination automatically the instant normal lighting current fails. Lamps are available in seven models offering different light patterns and intensities. Standard units detect power failure in 110–120 volt, 50–60 cycle a-c circuits. Available for other voltages on special order.

For details, use **Key # FP-31** on inquiry card on page 19.

HIGH-RATE EXTINGUISHER

The Kidde Kompact, 2½ pound dry chemical fire extinguisher,

(For details, use Key # L-9 on inquiry card on page 19)

Provides proven protection from pneumoconiosis-producing and nuisance dusts

This popular respirator weighs less than 5 ounces, is easy to wear . . . practically unbreakable. More than 40 sq. inches twin filter area. Check valves guard against re-breathing stale air. Free literature on request describing full line of models. Order sample today from your safety equipment supplier or write direct—$3.25 postpaid.

H. S. COVER
Dept. 1109, South Bend 14, Indiana

"Respirators for Industry Since 1894"

(For details, use Key # L-10 on inquiry card on page 19)

made by Walter Kidde Company, Inc., has a U.L. rating of 4-B:C. It features fast, self-evident operation. By grasping the carrying handle, the safety lock automatically releases; aim the nozzle and press discharge lever. Easy recharging consists of unscrewing and throwing away the empty powder container and replacing with a new, pressurized cylinder. The Kompact comes with a fast release, firm grip clamping band bracket which releases with the pull of a finger.

For details, use **Key # FP-32** on inquiry card on page 19.

SMOKER DISPOSAL UNIT

Standard Industrial Products Co. has announced the Model #TR-"Trimstyl" Dunking Station Unit. The new unit has the same width (6¼″), and front to back dimensions (4″), as the popular Model "M" Midget canister, but is 7″ high. Thus the capacity is more than doubled, but the unit still fits well into many locations where the canister must not extend out more than 4″ from the mounting surface. It is constructed of heavy duty cast aluminum, and has a "lift off" mounting bracket. Available in either bright polished or gray-crinkle canister with satin finished lid.

For details, use **Key # FP-33** on inquiry card on page 19.

FOAM PRODUCING SYSTEM

A machine capable of generating 12,000 cubic feet of foam per minute and driving it 2,000 feet from the mouth of the unit, is being

(Continued on page 42)

The only work of its kind in existence

THE MANUAL OF SAFETY TECHNIQUES AND SAFETY DIRECTORY

showing . . . and specifically recommending

WHAT TO USE and WHY

WHEN TO USE IT
HOW TO USE IT
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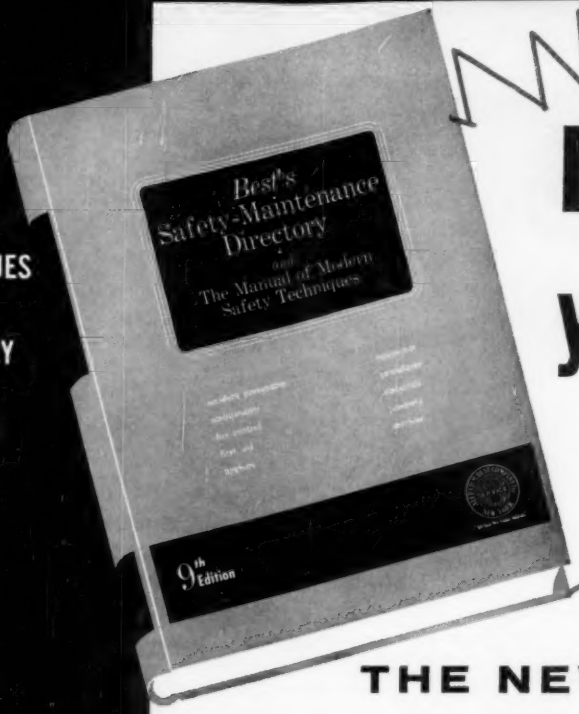

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Foam Producing System
(from page 39)

manufactured by Safety Development Corp., primarily for use in fighting mine fires. The Hi-Ex may also be adapted for fire protection in warehouses and industrial plants. The high expansion foam, having 1,000 times the volume of the liquid, fills every air space and starves the flames for oxygen. Conversion of the bubbles to water and steam absorbs the fire's heat, creating a cooling action, preventing recombustion, and eliminating the hazard of gaseous explosions. Examined by the U. S. Bureau of Mines.

For details, use **Key # FP-34** on inquiry card on page 19.

DRAIN CAN FOR FLAMMABLE LIQUIDS

A new can for draining flammable liquids has been introduced by Eagle Mfg. Co. The top of the can has a large funnel with a wide opening and perforated metal fire baffle to guard against flames or sparks. The top is easily removed for emptying or cleaning the can. The can has a seamless body drawn from one-piece 24-gauge terne coated steel, and electrically welded. Equipped with a heavy wire handle for easy carrying. Unit has Factory Mutual approval. Capacity is 3 gallons.

For details, use **Key # FP-35** on inquiry card on page 19.

NFPA Elects

Loren S. Bush, chief engineer of the Pacific Fire Rating Bureau of San Francisco, was re-elected president of the National Fire Protection Association, non-profit technical and educational organization which provides the country's fire safety standards.

Mr. Bush is a veteran of almost 40 years in fire protection including a four-year term as a vice-president of the NFPA following twelve years as one of its Directors.

Besides being nationally known within the insurance industry, particularly in the area of rural fire protection, Mr. Bush is almost equally recognized outside the field for his many achievements in civil defense as well as in numerous civic, fraternal and professional organizations.

Other Officers

Other officers re-elected at the NFPA annual meeting include:

J. Sharp Queener, manager of the Safety and Fire Protection Division, E. I. duPont de Nemours Co., Wilmington, Del., as first vice-pres.

Warren J. Baker, chief engineer and manager of the technical department, Insurance Co. of North America, Philadelphia, Pa., as second vice-pres.

Hovey T. Freeman, president, Manufacturers Mutual Fire Insurance Co., Providence, R. I., as secretary-treasurer.

Re-elected as chairman of the National Fire Protection Association's Board of Directors is T. Seddon Duke of Philadelphia, Pa., president of the Star Sprinkler Corporation of that city.

Newly named to the 21-man Board of Directors for 3-year terms are:

John J. Ahern, director of security, General Motors Corporation, Detroit, Michigan.

Lewis A. Marshall, chief of the Providence, R. I. Fire Department.

George Segeler, director, Utilization Bureau, American Gas Association, New York, N. Y.

Renamed to the Board are:

R. H. Ferguson, assistant director, Industrial Relations, Republic Steel Corporation, Cleveland, Ohio.

W. H. Forristall, general manager, Factory Insurance Association, Hartford, Connecticut.

Fire Protection for Space Program

New concepts and new systems of fire fighting are sorely needed to cope with the rapidly expanding space programs, the National Fire Protection Association's 65th annual conference was told by Calvin H. Yuill of Southwest Research Institute. He cited numerous instances of lack of good fire protection engineering in the design of missile bases.

Accidental fires have caused serious delays in the missile program, he stated. Some of the reasons for this state of affairs are these, according to Yuill:

1. The complexity of the fire protection problems at the sites, involving the storage and handling of huge quantities of dangerous fuels and explosives;

2. New developments and processes in sophisticated weapons systems and highly reactive propellants whose performance and hazards can't always be predicted;

3. Need for improved analysis of accident records and fire experience, and development of operations manuals and the like among the missile manufacturers, testing agencies and military operators;

4. Disagreement among "experts" as to what constitutes hazardous conditions, and even "disturbing variations in information published on characteristics of various propellants;"

5. "A tendency to accept unproven, arbitrary, rule-of-thumb formulae to determine water requirements" resulting in inadequate water supplies for fire fighting at launching sites;

6. Lack of competent fire protection engineers available for service of this type or a lack of experience on which sound judgments can be based.

"Certainly it is true that in many cases accidents on the stand have been the only means of pointing the need for modifications that would provide a more appropriate degree of safety," Yuill declared.

He said that there are essentially two elements working against sound fire protection engineering at

missile sites: in any crash effort "no program is going to be held back until every conceivable problem is solved;" and, "the feeling of many architects and engineers that fire protection is a relatively simple matter that is within the competence of anyone with an engineering degree."

While experience has disclosed many weaknesses in built-in-fire protection, Yuill said, "fire *prevention* at missile sites has been of a very high order. Good housekeeping is noteworthy and in almost all instances safety personnel are in daily attendance. Also, frequent inspections are made by fire department personnel.

"This close supervision and cooperation between responsible units probably account for the excellent safety record maintained at these installations."

Two Fire Courses

The Public Safety Institute of the Purdue University Division of Adult Education is offering two fire courses early next year:

Fire Instructors Training Course: (January 15–19) A specialized training program for department fire training instructors with emphasis on methods, techniques, and development of teaching aids and materials. This course partially fulfills the basic requirements for Indiana Fire Department Instructors Certification.

Fire Administrators Course: (February 6–8) A seminar for fire chiefs, executive fire department officials, city council members, and municipal personnel responsible for the selection, training, appointment and supervision of fire officials.

For details about the courses, write to: Professor Shelby Gallien, Director, Public Safety Institute, Purdue University Div. of Adult Education, Lafayette, Ind.

Emergency Exit Hardware

Although state and local fire codes and industrial safety regulations all stress the need for efficient emergency exit devices in industrial plants, they are usually quite vague about just what constitutes an "efficient device," students attending the annual Builders' Hardware Training School sponsored by The Yale & Towne Manufacturing Company were told by their lecturers.

The result of this confusion is that inferior hardware is often used which makes the unsuspecting owner legally liable in civil or even criminal actions should his plant's fire exit devices, panic bolts and automatic door closers prove inadequate in times of emergency. Even if disaster does not strike, the plant owner will still be paying a penalty for inadequate hardware because it increases the amount of his fire insurance premiums. It is the responsibility of the professional builders' hardware consultant to assist the architect and specifications writers in the selection of proper quality hardware for the factory which will not only function efficiently but also will hold up under heavy use without requiring extensive maintenance or costly repairs.

Paint Coatings As A Fire Hazard

Fire prevention engineers and other interested parties have been concerned by the possible contribution which thick layers of ordinary oil base wall and ceiling paint make to the spread of fire. Study of fires which apparently spread by means of burning wall and ceiling paint usually indicates that the primary cause of fire spread was not burning paint but rather the involvement of combustible trim, states a recent bulletin of the National Board of Fire Underwriters.

A recent hotel fire renewed speculation that thick layers of paint significantly contribute to the spread of flames. This fire started in mattresses standing in a corridor, then spread to other corridors and up a stairway. The spread of fire seemed to have taken place along the painted surfaces of the plaster walls and ceiling. The average thickness of the wall and ceiling paint was 1/40 inch.

Because of the thickness of paint involved in this fire, and because of its apparent contribution to the fire spread, the National Board of Fire Underwriters sponsored tests at Underwriters' Laboratories to establish flame spread ratings for representative samples of thick layers of paint on plaster walls.

Test Procedures

In preparation for this test, paint coatings of 1/40 inch and 1/20 inch were built up on asbestos-cement board, a material selected to simulate plaster. The test paint was a commercially available semi-gloss alkyd enamel.

Nine coats of paint were required to build up a paint thickness of 1/40 inch on the test panel while seventeen coats of paint were required for the 1/20 inch sample. The completed 1/40 inch sample dried for forty-three days before testing; the completed 1/20 inch sample dried for twenty-five days before testing.

The prepared panels were subjected to testing in the Underwriters' Laboratories "tunnel," a twenty-five foot tunnel used in determining fire hazard classification of materials. The painted panels were rated for flame spread, fuel contribution and smoke development on the basis of the test results.

Three samples with 1/40 inch coating gave respective flame spread ratings of 49, 53 and 74, an average rating of 14.5; samples with 1/20 inch coating gave flame spread ratings of 49, 53, and 74 for an average rating of 54. The fuel contributed ratings averaged 21 for both coating thicknesses. The smoke developed rating averaged one for the 1/40 inch coating and 54 for the thicker coating.

These tests indicate no significant fire hazard from ordinary oil-base paint coatings. In the hotel fire mentioned the paint coatings on plaster may have been of less importance as a factor in flame spread than the other combustible material involved in the fire. These tests also confirm tests made by the National Bureau of Standards. In these tests the paint coatings were applied to metal. The test results were printed in the National Bu-

(Continued on page 44)

DIG THIS CAVE! Hewn from solid granite, this cavern serves as storage vessel for propane. Inert carbon dioxide was used to displace enough air to create a safe, non-combustible atmosphere for propane.

Combustion Hazard Displaced

In what is believed to be the biggest purging job ever completed, the air from a 2.2-million-cubic-foot underground cavern in eastern Pennsylvania was recently displaced so it could safely be used for the storage of propane. 112 tons of carbon dioxide were used to remove the explosion hazard by displacing much of the air in the cavern and providing an inert atmosphere. The job took 20 hours.

The cavern, at Sun Oil Company's Marcus Hook, Pa. refinery, has a capacity of 400,000 barrels and is the largest in the country to be hewn out of granite. Its only access is a single shaft 42 inches in diameter.

Carbon dioxide vapor was introduced through two 3-inch pipelines extending from the surface into two sumps at the bottom of the cavern. As the heavier-than-air gas entered at the bottom, air was discharged through a vent at the surface.

When the cavern was about three-quarters filled with carbon dioxide, this application was stopped. A few hours later, Sun Oil began its injection of propane and the vent was left open to permit escape of additional air and some carbon dioxide. Small amounts of carbon dioxide remaining in the cavern after the vent finally was closed was absorbed in the propane and will have no appreciable effect on its combustion properties, a Sun Oil spokesman said.

The cavern was completed late in 1960 after a 13-month mining job. All equipment, including a bulldozer, was disassembled at the surface and lowered through the 42-inch shaft. Broken granite was hoisted in 285,710 trips up the passageway. Average height of the L-shaped storage area is 40 feet, and the cavern roof is 380 feet below the ground's surface. The roof is supported by eight granite columns, each 40 feet in diameter.

Picture by courtesy of Cardox Div., Chemetron Corp.

August Losses Up

Estimated fire losses in the United States during August amounted to $91,633,000, the National Board of Fire Underwriters reported. This loss represents an increase of 1.8 percent over losses of $90,037,000 reported for August, 1960, and a decrease of 1.6 percent under losses of $93,113,000 for July of this year, according to Lewis A. Vincent, NBFU's general manager. Losses for the first eight months of 1961 now total $819,763,000, an increase of 9.7 percent from the first eight months of 1960, when they amounted to $747,006,000. These estimated losses include an allowance for uninsured and unreported losses.

Coatings as Fire Hazard

(from page 43)

reau of Standards Technical News Bulletin No. 327 which stated:

"While a single paint coat is only about 0.001 inch thick, successive applications such as on ships, may build up a coating of considerable thickness. It was found that the hazard increases with thickness of coating because of the greater amount of fuel and more ready spread of fire. Paint coatings after normal aging, involving evaporation of solvents and oxidation of the film-forming oils, will burn with difficulty on metal unless the coating is heavy. This is because of the high ignition temperatures of the paint film and the retarding effect of an incombustible base on the burning of any thin veneer attached thereto. For coating thicknesses as high as 0.05 inch, representing some 50 brush coats, paint coatings will burn and contribute to the spread of fire." It should be noted that thicknesses representing fifty brush coats would be encountered infrequently.

"The explosion hazard from burning and heating of paint on hot plates was found to be minor on account of the small volume of combustible gases given off, mainly carbon monoxide, in comparison with the amounts of carbon dioxide and water vapor."

It is apparent that after normal aging paint coatings burn with difficulty unless the coating is heavy. Unusually heavy coatings, such as a thickness of 1/20 inch which represents some 17 to 50 coats depending upon the thickness of individual coats, will contribute somewhat to the spread of fire. Thinner paint coatings may contribute to the spread of fire, but to a more limited extent.

INDUSTRIAL HYGIENE AND HEALTH CONSERVATION

Edited By

MARK M. LUCKENS, M.S., F.A.I.C.

Industrial Toxicologist and Hygienist

•

Author of "Manual of Industrial Hygiene and Toxicology," "Manual of Methods of Air Pollution Control," "Monographs of Industrial Hygiene"

•

Member of American Industrial Hygiene Association, N. Y., Fellow American Institute of Chemists, American Chemical Society, American Academy of Forensic Sciences (Toxicology Section)

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Industrial Hygiene Monograph on Ammonia

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Motivation in Artificial Respiration

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The Head-Tilt Technique in Mouth-to-Mouth Resuscitation

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Atomic Energy Licensee Inspections

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Rescue and First Aid Meeting

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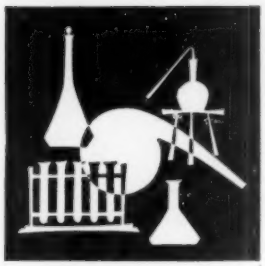
INDUSTRIAL HYGIENE MONOGRAPH #3



by MARK M. LUCKENS

AMMONIA

A. Chemical and Physical Data

Formula:	NH_3
Molecular Weight:	17.03
Usual Form:	Colorless gas at normal temperatures and pressures
Odor:	Characteristic, pungent, sharp, irritating
Density:	a. 0.59 (air = 1) @25°C, 750 mm Hg. b. 0.7710 gm/L (gaseous state) c. 0.817 (79°C) (liquid state)
Melting Point:	–77.7°C
Boiling Point:	–33.35°C
Solubility:	a. 89.9 gm/100 ml H_2O @ 0°C (gaseous state) b. 7.4 gm/100 ml H_2O @ 100°C c. Soluble in ether, organic solvents **Strong ammonia water (ammonium hydroxide, NH_4OH) contains 28–29% NH_3 @ 25°C, has a specific gravity of 0.90, and a vapor pressure of 500 mm Hg. @ 27°C.
Odor Threshold:	a. Less than 5 ppm (vol), some studies b. 53 ppm (vol), some studies c. 0.37×10^{-1} mg/L (or oz/M ft^3)
Flammability:	a. Non-flammable in air except in comparatively high concentrations b. Ignition temperature . . . 651°C
Explosive Limits:	15.5% to 26.6%, by volume
Metrology:	a. 1 mg/Litre = 143 ppm b. 1 ppm = 0.7 mg/cu.m. @ 25°C, 760 mm Hg. c. 100 ppm = 0.07 mg/L

B. Occurrence

In nature, ammonia is one of the products of the putrefaction of organic nitrogenous matter. The air in the vicinity of decaying matter may contain as much as 1500 ppm of the gas. Where the decomposing material is dispersed in or contains significant amounts of water, all or some of the ammonia will be present as a solution of ammonium ion.

Industrially, it is manufactured by the catalytic reduction of nitrogen or by the action of steam on cyanamide. It is a by-product of the destructive distillation of coal, and presents a hazard in these industries as well as other operations where the gas or its solutions are used in processing or are the result of chemical reaction.

Liquefied ammonia is used extensively as a refrigerant, in chemical synthesis, in the preparation of ammonia solutions of various concentrations for use as fertilizers, cleaners, chemical reagents, etc. Ammonia and/or its solutions are used in, or present a hazard in, the manufacture of coke; certain smelting operations; textile production and coloring; the production of dyes, and explosives, as well as many other organic and inorganic compounds (including nitric and sulfuric acids); in petroleum refining; steel treatment; water purification; silvering of mirrors; manufacture of glues, lacquers, artificial ice; tanning, etc.

C. Physiologic Response

Ammonia is a toxic, irritating, corrosive gas highly soluble in water, which, when absorbed in sufficient quantity, acts as a convulsant poison. It elicits the coughing reflex and, in sufficient concentration, may cause respiratory collapse. Liquefied ammonia in contact with the skin or other tissues will cause severe chemical burns and corrosion. Inhaled ammonia has an immediate effect on the mucosa of the upper respiratory tract as well as the conjunctiva and cornea. Urticaria has been observed in hypersensitive persons on exposure to low concentrations of the gas.

Inhalation results in inflammation and edema of the respiratory tract, substernal pain, salivation, loss of sense of smell, nausea, vomiting, headache, and urinary retention depending upon the degree of exposure. Exposure to moderately high to moderate concentrations of the gas may result in spasm of the vocal cords and edema of the glottis; bronchitis; tracheitis; laryngitis; and pharyngitis. Inhalation of high concentrations of ammonia causes violent coughing and may result in respiratory arrest. In addition to their corrosive ac-

tion on the mucosa of the nasopharyngeal area and the upper respiratory tract, high concentrations can result in permanent corneal injury. Pulmonary edema is an outstanding symptom. Shock or convulsions have also been observed. Heart action and the kidneys may be affected. In women, abortions and excessive menstruation have been observed.

Chemical burns and blistering have been observed on exposure to atmospheres containing 3 percent (30,000 ppm) of the gas. A 1 percent concentration of the gas is irritating to moist skin. At 2 percent, the effect is much more pronounced.

At 140 ppm, the gas irritates the eyes and nose slightly. While a concentration of 350 ppm may be tolerated for an hour or so, olfactory fatigue sets in and sensory response to the irritation becomes less pronounced. This overcomes the initial response to the natural warning properties of the gas. Four hundred parts per million irritate the eyes, nose and throat immediately. Exposure to 2500 ppm, for as little as half an hour, is dangerous, while exposure to 5000 ppm is rapidly fatal.

The severity of symptoms following the **ingestion** of ammonia solutions is, to an extent, dependent upon the concentration and amount taken. In general, there is a burning pain in the mouth, pharynx, esophagus, and chest coughing, vomiting, and collapse. In addition edema, corrosion of the esophagus and inflammation of oral structures and gastrointestinal tract may occur. As in the case of other corrosive poisons, strictures or perforation may occur in the esophagus or stomach with accompanying fever, abdominal pain, and abdominal rigidity.

Eye injuries resulting from ammonia gas, under pressure, or concentrated solutions are of a very serious nature. They are characterized by immediate severe pain followed by conjunctival edema and corneal clouding. Atrophy of the iris and retina, or cataract formation may follow. Blindness is not infrequent.

The maximum allowable concentration of ammonia for an 8-hour (industrial) exposure is 100 ppm. Exposure to concentrations below those causing irritation have not been shown to have a deleterious effect on exposed personnel. Animal experiments indicate chronic effects due to the ingestion of aqueous ammonia solutions over a period of time. Fatalities have been reported from the ingestion of approximately 1 ounce of a 25 percent solution of ammonia. Susceptible species of plants have been adversely affected by exposures of 5 hours duration to concentrations of 8.3 parts per million of ammonia.

D. Emergency Measures

1. Discontinue the exposure at once
2. Call a physician at once
3. Dilute the alkali by:

   a. Flooding the skin area with water for at least 15 minutes.
   b. For ingested ammonia, give **AT ONCE** large quantities of water containing if possible, vinegar or citrus juices. If only hydrochloric acid is available give 3 to 6 ounces of a 0.5% solution. Give demulcents . . . beaten eggs or egg whites (at least 12), milk, gruel, olive oil.
   DO NOT WASTE TIME SEARCHING FOR AN ANTIDOTE. Even a delay of a few minutes may allow serious damage to stomach or esophagus. Do not try to insert a Levine tube. Do not induce vomiting.
   c. **DO NOT GIVE AN EMETIC.**
   d. Ingested alkali must be diluted approximately 100 times to make it harmless to tissues.
   e. **DO NOT NEUTRALIZE CHEMICALLY,** especially when ingested or in eyes.
   f. Hold eyelids apart when flushing acid from eyes with water. Immediately call an opthalmologist. If one is not available, instill 1% atropine sulfate into the eye until the pupils are widely dilated. Take the patient to an ophthalmologist.
   g. If clothing is contaminated, direct stream of water under clothing while clothes are being removed.
   h. Inhalation—remove from further exposure and keep the patient warm and in fresh air. Inhalation of steam may be tried to alleviate irritation of the respiratory tract. Tracheotomy may be necessary.

Air Pollution Engineering

A new committee, whose aim is to bring engineering skills to bear on problems of air pollution and refuse disposal through burning, has been formed under the auspices of The American Society of Mechanical Engineers. It held its first meeting in New York. Approximately 50 engineers attended the organization meeting.

According to William Raisch, general Chairman of the Incinerator Committee, plans have already been made to sponsor a series of meetings in the New York metropolitan area during 1962. Members will discuss such problems as the design of modern incinerators that will operate efficiently without adding to air pollution.

With greater emphasis being placed on the problems of air pollution control, and the fact that many towns and cities may soon be compelled to construct incinerator plants, the Committee feels that the Society should lend its assistance in the orderly planning of such installations. In the past, incinerator plants were sometimes built without due regard to air pollution control.

Mr. Raisch commented that the new committee plans to cooperate with similar organizations or subdivisions of existing engineering societies.

In addition to the main committee, seven subcommittees have been established dealing with, respectively, design, stokers, materials handling equipment, refractories, auxiliary equipment, operation and air pollution control. Invitations to participate in the work of the subcommittees have been issued by the committee to any interested indivduals.

MOTIVATION

in artificial respiration training

by **L. CLANCY NANRY**
Director of Safety
Detroit Edison Co.
Detroit, Michigan

Extensive research in recent years has established that the mouth-to-mouth technique of artificial respiration is the most effective emergency method. On the practical level, what are the problems faced by industry in setting up a continuing, well planned, enthusiastic program of training in artificial respiration?

At the very start and as your training program progresses, you will need counsel and advice. Employees will ask many questions concerning the human body, respiratory problems, etc., which may be difficult for the average instructor to answer. Continuing training problems on artificial respiration will arise on which the instructor or safety coordinator will need advice. Work closely with your own company medical director, if you have one, or with outside medical counsel retained by your company.

Artificial Respiration, an Integral Part of First Aid

It is usual practice, at least in our industry, to train our employees in artificial respiration as part of the standard or advanced first aid course as sponsored by the American Red Cross. Then at least once a year those who have had these basic courses are brought in for a review session where artificial respiration is given special emphasis along with control of bleeding due to injury. This keeps the employee up to date and gives him actual practice with some degree of regularity. More important, it gives the employee confidence, on or off the job, should an emergency arise.

Selecting an employee to take training in first aid and in artificial respiration makes him feel important. It is a type of recognition by his management and by his direct supervisor.

Selecting a first aid instructor sometimes presents a little different problem. In our company, certain persons had learned to apply artificial respiration as students. They did very well and were asked to carry on instructing others. Perhaps due to failure of proper explanation, these persons were of the opinion that this might interfere with their regular line responsibility and that they might be bypassed should an opportunity to advance occur.

Those in authority should stress the point that here is a chance to teach and to learn by teaching. It

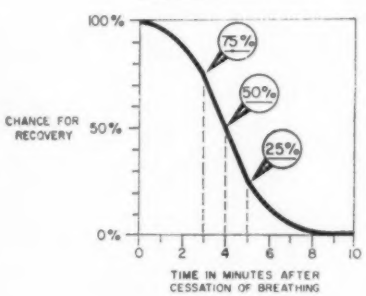
Why is the mouth-to-mouth method of artificial respiration best, and how is it best performed?

The best method must satisfy three major requirements. It must provide:

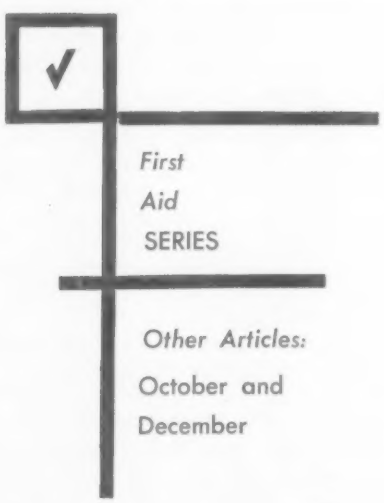
1. **Speed of application**
2. **Clear air passages at all times**
3. **Optimum ventilation of the lungs.**

1. Direct mouth-to-mouth resuscitation can be applied immediately under almost any circumstances. The necessity for speed is emphasized by Fig. 1 which shows the chances of recovery according to the time that has elapsed since breathing stopped. Note that the chances for successful resuscitation decrease from 75 percent to 25 percent between the third and fifth minute. Thereafter the possibilities for success are negligible.

FIGURE 1



2. The simplest and best way to clear the air passages is shown in Fig. 2. The jaw of an unconscious victim usually drops backward, and the tongue, which is attached to the jaw and the floor of the mouth, exerts a pinching mechanism in the throat to obstruct the air passages (Fig. 2A). Tilting the head back as far as it will go—with the chin pointing straight up—lifts the



should be pointed out to the would-be instructor that if he can handle this successfully, this training rather than act as a deterrent, would improve his capabilities and would put him in a position to accept a better job and greater responsibility.

Should the Instructor be Local or Central?

Carrying instructor selection a little further, should the instructor represent a central office and go out into the various departments to carry on instruction? Somewhat the opposite of this, should each department of a company or geographic area of a department supply their own instructor? Up to the early 1940's, our central safety department did the instructing for most of the departments of our company. Frequently it meant that a central staff instructor would arrange for and schedule the class and would travel as much as 100 miles to see that employees in distant areas were properly trained.

That has been changed in more recent years. Instead of one or two instructors, we have some 35 fully capable departmental instructors properly qualified by the American Red Cross to carry on the work in their own departments and in their own geographic areas. Training in pole top resuscitation in our overhead lines department is a good example of where department instructors do a better job. In general, department heads feel that this is their own program and not a program sponsored by some outsider. This arrangement leads to much better coverage, better trained personnel and a much more intensified program.

Skills for "On the Job" and "Off the Job"

Thorough training in artificial respiration has developed two kinds of skills, that of application and that of instructorship. It has supplied student and instructor alike the opportunity to excel and to prove themselves before those with whom they are closely associated. It has made them more valuable in the eyes of their company and it has given them a feeling of satisfaction on the job, and this is a carry-over into the home. Frequently, too, it results in a good influence on the man's entire family.

Today more than ever before, intensified, well directed off-the-job safety programs are being stressed. Artificial respiration must be a very important part of our training if our efforts are to be effective.

Good Employee & Public Relations

Through carefully planned, adequate training, employees look upon their company as a good place to work. Employees working and training together become more and more proficient, ever ready in time of need to save life.

Well informed employees have been a great factor in improving employee morale. While we may take such training more for granted today than in years past, yet it still has its influence. Were it to be suddenly discontinued, there very likely would be complaints and unhappy employees.

A sound, well planned teaching program of artificial respiration has its effect not only on employees within the company but also on the public, your customers and friends. It helps to build good public relations. Your company becomes known as a good place to work. Frequently, too, this is reflected in an improved company safety record.

While it would not be fair to give entire credit to artificial respiration and first aid, yet we at Detroit Edison truly believe it has been a very important influence in reducing our company injury frequency from 25.42 in 1947 to 3.37 in 1959.

In artificial respiration training, the use of visual aids for training and retraining is very important. Over the years devices have been used successfully to develop skills and to hold and create employee interest. Also in our company, recognition given to employees and instructors alike has placed high importance on teaching and training of artificial respiration.

A series of flip charts on first aid and artificial res-

THE HEAD-TILT TECHNIQUE IN MOUTH-TO-MOUTH RESUSCITATION

by **ARCHER S. GORDON**, M.D., Ph.D.
Director of Thoracic & Cardiovascular Surgery
Children's Hospital
Los Angeles, Calif.

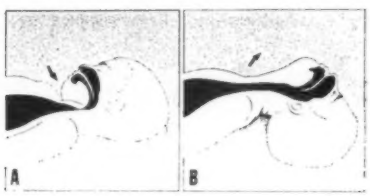


FIGURE 2

tongue from the back of the throat and clears the air passages (Fig. 2B). This "head-tilt" method can be used on adults or children, with either a relaxed or tight jaw and under almost any circumstances.

3. The amount of lung ventilation produced by various methods of artificial respiration, based on tests on anesthetized, non-breathing adult subjects is summarized in Fig. 3. It indicates that the push-pull manual methods and mouth-to-mouth resuscitation provide adequate lung ventilation when the air passages are kept open by means of a tube inserted into the trachea. However, only mouth-to-mouth is as as effective and ventilates all cases when such an andotracheal tube is not used. This emergency tech-

(Continued on page 50)

piration was developed by Mr. Warren McAlpine of our substation department in 1945. The unit was lighted with fluorescent lights and caught the eye of the student. Later 2 inch by 2 inch slides were made and used alternately with the flip-charts as a teaching aid.

Films on rescue breathing have been a great aid in training our people in mouth to mouth resuscitation. As time progressed, however, it seemed that we needed something to augment the film; something with which we could get actual practice. A training device, available commercially, supplied this. It put reality into the training program. The employee could actually take part and practice.

In addition we use a device called the "Resusciquin" which was developed by Mr. Elwyn Davidson and his substation department associates of our company. This device requires that the trainee simulate forward movement of the lower jaw. When the jaw has been properly adjusted, then the nostrils must be closed.

After these essentials of mouth to mouth resuscitation have been taken care of, then the chest of the dummy can be observed rising and falling when the mouth is breathed into, which indicates that the trainee is actually introducing air into the lungs of the victim. If either of these essentials is forgotten, then no air can be blown into the lungs. For sanitary reasons, a paper insert is placed in the mouth. This, of course, is replaceable for each student.

The purpose of the device is to implant in the memory of the trainee the things he must do to perform a successful mouth to mouth resuscitation. Three of them are being used in our company at present with wonderful acceptance by the personnel.

What I have covered is only a very brief resume of the good that can result from a program of artificial respiration in industry. Many of the advantages may seem intangible. Our results have been tangible, too. In June of last year two members of our overhead lines department received special Edison Electric Institute recognition for successful resuscitation. Knowing what to do, how to do it and doing it promptly is the answer in this case. It was also the answer in many other successful industrial resuscitation cases reported in prior years.

From an address presented at the 48th National Safety Congress.

Lung Ventilation Produced by Artificial Respiration

METHODS		TUBE IN WINDPIPE		NO TUBE IN WINDPIPE	
		Amount of ventilation (cc)	Percent of cases ventilated	Amount of ventilation (cc)	Percent of cases ventilated
Mouth-to-mouth resuscitation		1100	100%	1050	100%
Manual artificial respiration	Back-pressure Arm-lift	950	100%	550	50%
	Back-pressure Hip-lift	1075	100%	650	66%
	Chest-pressure Arm-lift (Silvester)	900	100%	450	33%

FIGURE 3

HEAD-TILT TECHNIQUE

nique assures that all victims are receiving proper artificial respiration. Mouth-to-mouth resuscitation satisfies the three major criteria listed above.

Head-Tilt Refinement

In the original studies of mouth-to-mouth resuscitation it was found that lifting the jaw with a finger in the mouth, or pushing the jaw forward with the fingers behind the angles, maintained a clear airway and allowed good lung ventilation. However, in recent studies, the "head-tilt" method was found to be easiest to teach and best performed. It requires the learning of fewer anatomic details; is less difficult to do, especially by the unskilled; takes less time (in tests it averaged 20 seconds faster); and, by shifting to the mouth-to-nose technique, permits immediate inflation of the lungs on victims whose jaws are difficult or impossible to open.

Details of the performance of the "head-tilt" method are illustrated in Fig. 4.

Lifting the neck allows the head to drop backward. Sometimes this simple, initial maneuver adequately clears the air passages and the victim will begin to breath spontaneously.

FIGURE 4

The head is then moved into maximum extension by one hand pushing the crown under and the other hand pushing the chin until it points straight up.

Still holding the head in this position, the rescuer opens his mouth *widely*, makes a tight seal over the mouth OR nose of an adult (the mouth AND nose of a child), and inflates the lungs. When he blows in the nose, the rescuer's cheek covers the victim's mouth and prevents air leakage; when he inflates via the mouth, his cheek covers the victim's nose to prevent leakage.

He then removes his mouth and allows the victim to exhale passively.

This cycle is repeated about 12 times per minute

for adults, about 20 times per minute for children.

For adults, the rescuer takes a deep breath and inflates the victim's lungs with about twice his normal resting volume. Children require smaller amounts, and infants can be ventilated with small puffs from the rescuer's cheeks only.

Resuscitation Tubes

Mouth-to-mouth or mouth-to-nose resuscitation should always be performed immediately without waiting for any adjuncts. About 70 percent of successful rescues are performed by members of the family, friends or passersby, individuals who do not usually have accessory breathing tubes available. While these "airways" do not improve the method, they do provide a means of avoiding direct contact with the lips or nose of a moribund stranger.

In an emergency no delay should be entailed in seeking such equipment. A clean handkerchief or cloth may be used between "rescuer" and "victim" in actual emergencies and in practice sessions too. It does not interfere with rescue breathing. However, if not available in an emergency, don't worry about infections when a life is at stake!

From an address presented at the 48th National Safety Congress.

Public Health Awards

Establishment of the annual Bronfman Prizes for Public Health Achievement, a new series of major awards to honor "outstanding current creative work leading directly to improved health for large numbers of people," has been announced by the American Public Health Association. The prizes have been established with a grant from the Samuel Bronfman Foundation, Inc.

Berwyn F. Mattison, M.D., executive director of the Association, said that from one to three prizes will be awarded annually, depending on availability of suitable candidates. Each prize will consist of a $5,000 cash award and a commemorative symbol, now being devised. First awards will be announced and presented during the Association's 89th annual meeting in Detroit November 13–17.

The Bronfman Prizes will be awarded for work of particular effectiveness in applying newer scientific knowledge to community health rather than for achievements in basic or laboratory research. With the establishment of the Bronfman Prizes, the Association this year continues to grant only one other award—the annual Sedgwick Memorial Medal in recognition of long and distinguished careers in public health.

The announcement said that in honoring application rather than discovery of new scientific knowledge, the Foundation and the Association hope to increase understanding and appreciation of public health practice.

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Atomic Energy Licensee Inspections

The Atomic Energy Commission will consolidate licensee compliance inspections into five areas with regional headquarters at New York City, Chicago, San Francisco, Atlanta and Denver. The Commission's Division of Compliance has staff responsibility for inspection of all Commission licensed activities, including use of radioactive material and the construction and operation of licensed nuclear reactors. Previously AEC has maintained field compliance inspection staffs at eight of its Operations Offices.

The five regions will be comprised as follows:

REGION I—(New York City): Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

REGION II—(Atlanta): Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Panama Canal Zone, Puerto Rico, South Carolina, Tennessee, Virginia, Virgin Islands, and West Virginia.

REGION III—(Chicago): Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin.

REGION IV—(Denver): Colorado, Idaho, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, and Wyoming.

REGION V—(San Francisco): Alaska, Arizona, California, Hawaii, Nevada, Oregon, Washington, and U. S. territories and possessions in the Pacific.

This re-alignment of the Commission's licensee compliance inspection staff is expected to result in a more efficient use of field inspection personnel.

Rescue & First Aid Meeting

The 14th Annual Convention of the International Rescue and First Aid Association will be held at the Hotel Roanoke, Roanoke, Va., Nov. 2, 3 and 4, 1961. The Roanoke Life Saving and First Aid Crew and the Virginia Association of Rescue Squads will be co-hosts to the convention.

"Education will be the theme of the convention with six workshops, demonstrations and special presentations scheduled during the three-day program. The annual International First Aid Contest and the annual International Rescue Contest will be major features and a record number of teams is anticipated for each of the contests," Convention Chairman J. B. Taliaferro, Jr., Tappahannock, Va., stated in announcing convention features. Mr. Taliaferro is also IRFAA treasurer.

IRFAA Past President Julian S. Wise, internationally-known pioneer organizer of rescue and first aid squads and crews, is Co-Chairman of the Convention. IRFAA President M. Loyd Fuller, Dallas, Texas, will preside at the business sessions.

The convention will be open to any person interested in rescue, first aid and related subjects. The only requirement is that each person attending the convention workshops, sessions and special events must register. The registration fee is $3.00 in advance up to October 20; and $3.50 at the convention.

Workshop subjects will include specialized first aid and resuscitation; aircraft disaster rescue, highway safety, heart emergencies, light and heavy duty rescue, and underwater diving rescue and recovery.

The International Rescue Contest will be conducted under night conditions, regardless of weather, Nov. 3 at 7:30 p.m. on a Roanoke Redevelopment and Housing Authority tract near the Hotel Roanoke.

Both contests are open only to teams from member units or member associations of the IRFAA. Member units may enter one all-male (four-member) team and/or one all-feminine team—or one co-ed team in the first aid competition.

Trophies will be presented to the winner and next four place teams in each contest with the presentations to be made at the convention banquet in the Hotel Roanoke ballroom Nov. 4 at 7:30 p.m. Other awards will also be presented at the banquet which will be followed by the convention dance.

Canadian teams won both championship and two other trophies in the 1960 contests. Advance reports are that the Dominion Bridge Emergency Squad, Montreal, rescue contest winner, and the Metropolitan Toronto Branch of St. John Ambulance, winner in the first aid competition, will have their teams at Roanoke to defend their 1960 titles.

As a rule of thumb . . .

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YOUR SAFETY NEWS is a safety punching brochure that has become the official monthly house organ on safety for many prominent companies. This unique bulletin, with its diversified safety themes has been used successfully to create millions of safety-thinking employees all over the United States. It delivers down-to-earth safety hints with a **FRIENDLY NUDGE!**

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THE SAFETY SHELF

Emergency Lighting

A new, complete, 96-page handbook on emergency lighting, covering installation considerations, equipment specifications and maintenance requirements, is now available from Electric Cord Company for $2.00.

A non-commercial hardbound textbook, the new handbook is edited by a professional engineer and is designed to provide basic information on the problem of emergency lighting to consultants, architects, engineers, and others involved in building construction, design, or rehabilitation.

The handbook details reasons for emergency lighting; probability of power; legal considerations; installation design factors such as key points requiring illumination, size and shape of areas, illumination requirements, duration and source location; wiring requirements; diagrams showing typical installations; types of equipment commercially available; exit lighting; and maintenance requirements.

Included in the appendix is a sample engineering specification, excerpts from the National Electric Code, Article 7 and the Building Exits Code, a chart showing individual State requirements, and excerpts from State regulations where applicable.

Copies of the *Emergency Lighting Handbook*, at $2.00 each, may be ordered direct from: Electric Cord Company, Handbook Dept., 432 Plane Street, Newark 2, N. J.

Improved Shop Practices

An easy-to-use lighting calculator designed for shipyard use, a portable electric oven for baking paint, and a mobile welding unit are just three of the innovations described in a collection of machine shop practices recently adopted by the Navy's Bureau of Ships for use by its industrial facilities. Compiled from suggestions made by Navy employees, the collection of 72 time- and labor-saving devices has been released in an illustrated booklet through the Office of Technical Services, Business and Defense Services Administration. U. S. Department of Commerce, Washington 25, D. C.

Three Examples

A device described as "an easy-to-use calculator for determining lighting requirements" has been adopted by the Navy's Long Beach Naval Shipyard. The slide-type calculator incorporates the necessary mathematical formulas, data sheets, and tables. "Lighting requirements for any compartment can be determined in a matter of seconds," according to the announcement of the device's adoption.

Faced with the problem of baking paint on the main-engine exhaust of submarines, the Charleston Naval Shipyard adopted a portable electric oven developed by two of the shipyard's employees. Previously the shipyard had tried various methods of heating, including steam and a portable electric hot-air blower, without success. An illustration of the new oven is contained in this latest issue of the Navy's shop practice suggestions, along with details of its construction.

The mobile welding unit described in this publication was devised at the San Francisco Naval Shipyard. "With this unit, certain conventional welding power sources can be adapted for inert tungsten arc (TIG) welding," according to the description of the suggestion. "By using the mobile unit, the welding power source can be located in one place, and the mobile unit can be easily moved by the operator to the welding site," the shipyard reports.

The devices and techniques described in this third volume of Bureau of Ships Shop Suggestions offer time- and labor-saving solutions to a wide variety of machining problems. The suggestions are presented with photos, diagrams and drawings. This is the third semi-annual collection of useful techniques and mechanical inventions and innovations devised by Navy employees in shipyards and other industrial activities and submitted through the Navy's Beneficial Suggestion Program.

The suggestions were selected by the staff of the "Bureau of Ships Journal" and published by the Office of Technical Services. The Collection is *Bureau of Ship Shop Practice Suggestions, No. 3*, May 1961. 29 pages. (Order PB 171 251 from OTS, U. S. Department of Commerce, Washington 25, D. C., price 50 cents.)

Canning Accidents

This report No. 183 contains a detailed analysis of injuries and accident causes in the canning of fruits and vegetables, including:

1. *Kinds of injuries*
2. *Sources of injury*
3. *Types of accidents*
4. *Hazardous working conditions*
5. *Unsafe acts*

It is available from the Bureau of Labor Statistics, U. S. Dept. of Labor, Washington 25, D. C.

Safety Supplements on Hydrogen Peroxide

Two safety data sheet supplements on hydrogen peroxide are now available from the Manufacturing Chemists' Association, Inc. **Supplement SD-53-A** details the physical properties and provides minimum engineering design recommendations for bulk storage facilities for hydrogen peroxide solutions *not exceeding 52 percent* con-

centration by weight. There is an increasing interest on the part of consumers in installing tank storage facilities at their plants for operating convenience in order to accommodate bulk purchases.

Supplement SD-53-B reveals the properties and recommended practices for packaging, handling, transportation, storage, and use of hydrogen peroxide solutions *exceeding 52 percent* concentration by weight.

Concentrations of hydrogen peroxide above 52 percent, generally known as *High Strength Hydrogen Peroxide*, are commodities of increasing interest in commercial and military fields, especially the latter. Included in the information available in Supplement SD-53-B are important physical and chemical properties, uses, regulations, shipping containers and labels, bulk storage and handling equipment, safety precautions, and general information.

Copies may be obtained from the Manufacturing Chemists' Association, Inc., 1825 Connecticut Ave., N. W., Washington 9, D. C., at a cost of 30¢ each for Supplement A and 50¢ each for Supplement B.

Fallout Research Pamphlet

The Atomic Energy Commission has published the fourth pamphlet in a series describing its life sciences research program. The purpose of the series of pamphlets is to acquaint scientists, students and interested members of the general public with the objectives of the Commission's bio-medical program.

The booklet, titled "Atmospheric Radioactivity and Fallout Research," summarizes work in progress at 36 institutions under 40 research contracts or projects.

The first dozen pages of the pamphlet contain a brief history of this type of research. It covers the growth of networks for detection of radioactive fallout and their expansion through successive weapons tests series between 1947 and 1958.

Beginning in 1959, following suspension of nuclear weapons tests on October 31, 1958, and expansion of environmental survey programs by the Department of Health, Education and Welfare, the Commission has reduced fallout survey and monitoring activities and placed greater emphasis on fallout research. The Commission has assisted in training personnel of the Food and Drug Administration in the radiochemical analysis of food samples.

This booklet reflects the increasing attention now being given to the investigation of atmospheric radioactivity problems associated with other areas of the Commission's work, such as the development of nuclear power for missiles and space vehicles.

The publication "Atmospheric Radioactivity and Fallout Research" (TID-12616), may be bought from the Office of Technical Services (OTS), U. S. Department of Commerce, Washington 25, D. C., at 75 cents a copy.

Hose Streams

An important new publication on effective streams for fighting fires has been issued by the National Fire Protection Association. Designed to help fire departments develop the best hose streams for effective operation on the fire ground, the 88-page book was prepared by Warren Y. Kimball, manager of the NFPA Fire Service Department and managing editor of *Firemen* magazine.

New Hydraulic Tables

The text includes new suggestions for simplifying hydraulic calculations for the fire ground, along with 35 tables and 56 diagrams of hose layouts.

These will aid fire departments in practicing special evolutions with single and multiple lines, and in supplying nozzles on hand lines, as well as working effectively with ladder pipes and heavy stream equipment.

"Effective Streams for Fighting Fires" is available, at $2.00 per copy, from the National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass.

Company Organization of Insurance Management

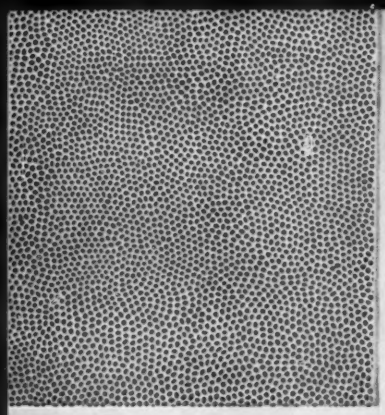
How American business concerns organize and manage their insurance programs is revealed in a report released by the American Management Association. Of the 221 companies surveyed, 76 maintain separate departments headed by an insurance manager and the rest delegate the responsibility for insurance management to the president, the general manager, the finance executive, or to a committee composed of several executive managers. The companies range in size from those with more than 100,000 employees to others with fewer than 1,000 employees.

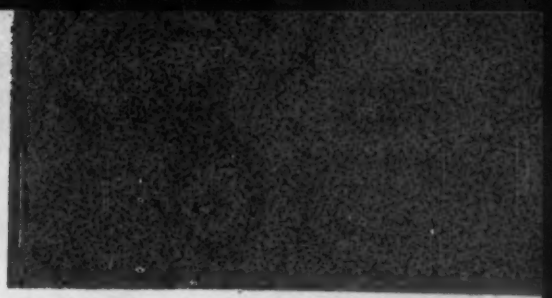
Safety campaigns are a part of the insurance program of 70 percent of the companies responding to the AMA survey. Staff personnel who are in charge of the programs undertake periodic inspections and serve in an advisory capacity when new construction is contemplated and when new machinery is to be installed.

The collection and reporting of data and estimates of replacement cost after a fire or other interruption in production are an important part of the insurance management function. Record keeping on production, use and occupancy values, and other data to be used by the company in case it becomes necessary to present a claim are another important function.

The 80-page book by Albert A. Blum includes sample position descriptions for the insurance manager and all other insurance department employees; a questionnaire for checking on conduct of insurance matters by branch offices; several multi-purpose loss forms; an outline for reporting fire loss figures; a report form for business interruption, giving use and occupancy values; a "notice of accident" form, and a sample form entitled: Report of General Public Liability and Property Damage Accident.

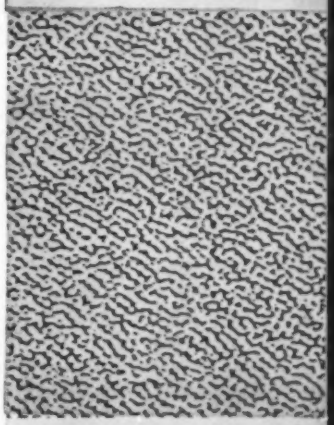
The volume is available for $3.75 (AMA members: $2.50) from: American Management Assoc., 1515 Broadway, New York 36, N. Y.

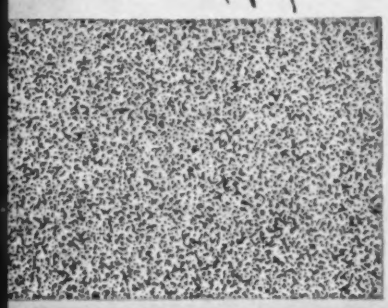


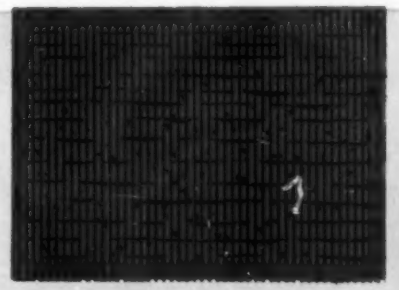


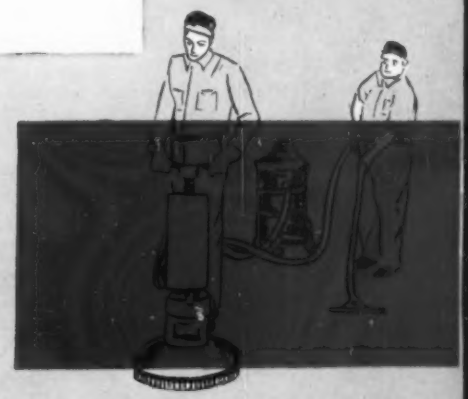
MAINTENANCE

- The Newer Resurfacing Materials
- Safety Installation for Maintenance Men
- Winter Care for Tractor Fuel Systems
- Polyethylene Sheeting Standard
- Mineral Wool Labeling
- Hack Saw Standard









THE NEWER RESURFACING

by **KENNETH N. BANTHIN**
Plant Engineer, Visking Co.
Div. of Union Carbide Corp.
Chicago, Illinois

The rapid growth and adoption of mechanical handling equipment has subjected factory floors to services that were not contemplated in the original design. Complete replacement with hardened or armored top floors have not been justified. Therefore, a number of patching and overlay materials have been developed.

For a number of years patching materials with an asphalt or bitumen base were the only ones available, but we now have some new materials that provide a surface under today's conditions. Following are brief outlines of these newer resurfacing materials for use inside the plant, surfacing products for parking areas and roads, and also some of the newer products and techniques that are simplifying the maintenance and improving the appearance of the grounds.

Latex-Modified Portland Cement—A latex modified portland cement mixture is used for patching or resurfacing over concrete, wood, or steel surfaces. It speeds the job of patching concrete floors by eliminating most of the laborious and costly preparation required by older methods. Where grade does not have to be maintained, none of the old floor has to be removed. If grade must be maintained, ¼" to ½" must be chipped out to provide a clean, sound base.

The new surface provided by the use of a latex modified portland cement mixture is strong, and has the resilience to endure the pounding of lift trucks, sliding of pallets, and wear of traffic. A layer from ⅛" to ½" is readily applied and brought to a feather edge contact.

Neoprene Latex-Base Overlays—Neoprene latex-base overlays materials provide an economical method for repair or installation of wash and shower rooms in existing buildings. This material is very adaptable for use over wood or deteriorated concrete floors where a smooth, non-slippery, and watertight covering is necessary. A reinforcement of hardware cloth is usually made fast to the old wood or concrete surface and then alternate layers of neoprene base overlay and burlap are spread and worked together to provide a smooth, non-slipping surface. This type of floor has a high resistance to caustic. This material can be laid up from ¼" to 1" or more in thickness.

Epoxy Surfacer—The epoxy surfacing and patching materials are fast becoming the standard materials where chemical resistance or resistance from abrasion, wear, and impact are required. They are being used both to protect new surfaces and to repair corroded ones without costly contracting jobs or long shutdowns. The material may be pigmented to provide decorative effects or to match the color of concrete. It is applied over any sound, clean, and dry surface by hand troweling or by new spray equipment.

This material must be placed reasonably fast, as a batch in a 5 gallon pail at 70–75°F. will have a working life of about 60 to 90 minutes. A layer 1/16" to ¼" is the most economical. When applied over steel plates or worn stair treads, it provides a non-slippery surface. This material generates heat by an exothermic reaction of the ingredients and this causes the material to set. Curing time is 8 to 12 hours, after which the surface may be placed in service. Where a layer in excess of ¼" is required, a filler or underlay of cement concrete is recommended.

Parking Lots & Roads

A customer, salesman, or prospective employee gains his first impression of a company's facilities by the character and condition of the grounds. Is adequately designated smooth parking space avail-

Floor Maintenance SERIES

Other Articles: December and January

MATERIALS

able? In what condition are the drainage, walkways, and lawns? All of these facilities are elements of overhead cost and therefore advantage must be taken of the newer materials and techniques for their maintenance.

Black Top—Introduction of more central batching plants for preparation of asphaltic-bond macadam, improved methods of placement, and lower cost has permitted the more extensive use of this material for construction of smooth, dust-free roadways and parking areas. Eroded and uneven concrete walks, driveways, and ramps no longer need to be torn out and replaced. These may be leveled, graded, and smoothed by the application of an overlay not less than ¾" thick of roller-compacted black top for less than half the cost of replacement concrete.

For development of new parking areas or roads a base of crushed rock, size from 3" to dust, water bond and roller compacted, must be installed. After grading to drains, this area is then topped with 1½" to 2" of hot-mixed and roller-compacted black top.

Seal Coat—The introduction and availability of modern, contract, hot-bituminous, pressure distributor trucks with 8' to 12' distributor bars, has made the use of a seal-coat surface economical and popular for improvement of existing and new water-bond macadam parking areas and roads.

A seal-coat surface is built up on the graded and cleaned water-bond macadam surface in this manner:

a. A primer coat (0.3 gallons per square yard) of bituminous material (MCO) is applied to the surface and permitted to dry for three to five days.

b. A seal coat (0.5 gallons per square yard) of hot (300°F.), bituminous material (MC5) is applied to the primed surface.

c. Immediately after the bituminous material has been applied, a seal-coat aggregate of pea gravel or stone chip is uniformly spread (25# per square yard) and roller-compacted to produce a uniform surface.

Grounds Maintenance

Parking Blocks—To control and designate parking space or stalls, the precast concrete parking block has provided a durable and economical assistance. The blocks can be readily installed and anchored into place. Many of the companies supplying these blocks also offer assistance for the layout of your lots to secure the maximum usage.

Signs—New, self-sticking, adhesive, plastic reflective "Stop" and directional signs are now available at reasonable cost. These are readily attached by plant personnel to aluminum supporting plates for installation of attractive, long-lasting signs. For special signs the pigmented epoxy and urethane coatings on heavy aluminum sheet provide excellent resistance to corrosive atmospheres.

Weeds—Each year new and improved herbicides and chemical formulas are offered to help in the perennial task of weed control. Some are compounded for selective control and others for complete eradication of all vegetation for a long period of time. Through the use of selective weed killers and

(Continued on page 62)

Standard Released on Polyethylene Sheeting

A recommended Commercial Standard for *Polyethylene Sheeting for Construction, Industrial and Agricultural Applications* has been released by the Commodity Standards Division, Office of Technical Services, Business and Defense Services Administration, U. S. Department of Commerce, Washington 25, D. C.

This recommended standard covers dimensional tolerances, intrinsic quality requirements, and test methods for polyethylene sheeting for construction, industrial, and agricultural applications. The dimensional tolerances include thickness, yield, width, and length. The intrinsic quality requirements include composition, appearance, impact strength, tensile properties, reflectance, opaqueness (low luminous transmittance), and water vapor transmission.

Copies of the recommended standard, designated TS-5534, are available on request from the Commodity Standards Division, Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

Maintenance Show

The next National Plant Engineering & Maintenance Show will occupy the largest exhibit area in its history, according to Clapp & Poliak, Inc., producers of the exposition. Now in its thirteenth year, the show will return to the East Coast in 1962, when it will take place at Convention Hall, Philadelphia, Jan. 22 through 25.

More than 400 companies are expected to exhibit. About 350 already have been assigned booth space. Among the exhibits will be many new and significantly improved products, including air conditioning, heating and ventilating equipment; building services and materials; communication systems; electrical equipment; instruments; inventory and work control systems; lubricants and lubricating equipment; maintenance tools and supplies; management services; materials handling equipment; plant furniture; plant protection equipment; pollution control equipment; plumbing equipment; power generation and distribution equipment; product finishes and finishing equipment; safety equipment; sanitation and cleaning equipment, storage equipment, and welding equipment.

Concurrently with the show, the 13th annual Plant Engineering & Maintenance Conference also will be held at Convention Hall. Like the show, the conference will be expanded to meet current needs.

Visitors may obtain show, conference and hotel information from Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y. Rapid registration cards to save time in registering for the show, and inquiry time saver plates, to assist visitors in obtaining further information, sales calls and literature, may be obtained from the same source. Special buses will operate from major downtown hotels to Convention Hall during the show and conference.

Safety Installation

Illustrated is an installation of a safety grating for an oil refinery. Personnel needed to cross a series of floor obstructions for maintenance and regular operations. For their safety and to avert damage to pipes, a stairway and catwalk of safety grating was installed. The open construction and the scientifically designed serrated surface means that employees have sure footing, even during rain, or heavy snow or ice coating conditions. Normal foot pressure breaks any ice coating that forms on the serrated grating, and the ice falls away from platforms or steps.

Pictures by courtesy of Bustin Steel Products, Inc.

Mineral Wool Labeling

A new measure of insulation values for blankets and batts has been adopted by the members of the National Mineral Wool Insulation Association. Replacing the old method of using thickness as a guide, the industry will now compute insulation values in terms of "R" (Installed Resistance) Factors, with "R" being the resistance of the mass insulation plus resistance added by adjacent air spaces and the exposed insulation surface resulting from the method of installation. All mineral wool insulation products marked with the same "R" number will have the same insulation value, regardless of individual thickness. A booklet giving full details and specifications for new insulation standards is available from the National Mineral Wool Insulation Association, 1270 6th Ave., New York 20, N. Y.

Hack Saw Standard

A proposed revision of the *Simplified Practice Recommendation For Hack-Saw Blades* has been submitted to the industry for written approval, according to the Commodity Standards Division, Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

This revision, which was requested by the Hack and Band Saw Manufacturers Association of America, will be the sixth. Each of the revisions, in accordance with procedures of the Commodity Standards Division, has been submitted to the industry for consideration and general acceptance. The current revision establishes two new high-speed, double-edged power hack-saw blades as standard items. In addition, four such blades, which were included in the Amendment of 1957 for cutting the special alloy materials, have been deleted because of a lack of sales volume.

Copies of the proposed revision —submitted to the trade for consideration as SP-4659—are available upon request from the Commodity Standards Division, U. S. Department of Commerce, Washington 25, D. C.

Winter Care for Tractor Fuel Systems

by the Service Department
Caterpillar Tractor Co.
Peoria, Illinois

When temperatures start dropping in the fall, tractor owners are quick to protect cooling systems against an unexpected freeze. Too often, however, they forget to check another possible collection of water that is equally as certain to shut down a tractor as frozen coolant. They forget, that is, until the morning after the first hard freeze when they have to wait for the temperature to climb high enough to melt ice blocking the fuel system.

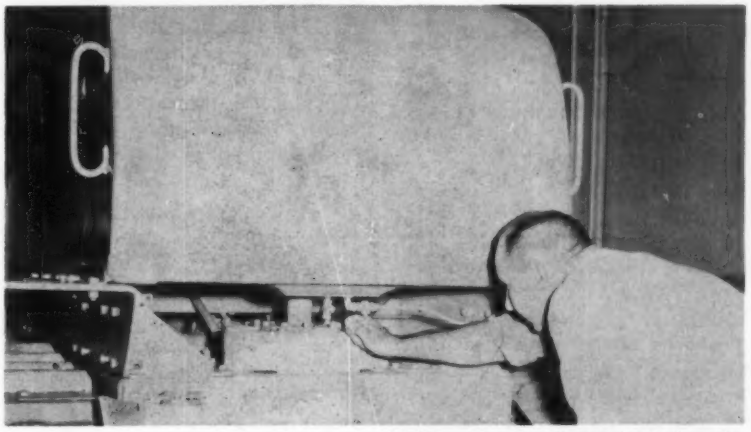
One such reminder usually is enough to keep them taking special care of their fuel systems for the rest of the winter. They can avoid the reminder and resultant delay, however, by starting winter fuel system care as soon as the first freeze threatens. What does special winter fuel system care involve?

The most important thing is to keep moisture out of the system. Cool temperature condenses moisture from the air. Thus during cold nights, as the air in the top of the fuel tank cools, water forms and settles to the bottom. From there it can travel through the fuel system, settling in low places in the fuel line and in the base of the fuel filter housing. When the tractor stands overnight in freezing weather, these collections of water turn to ice.

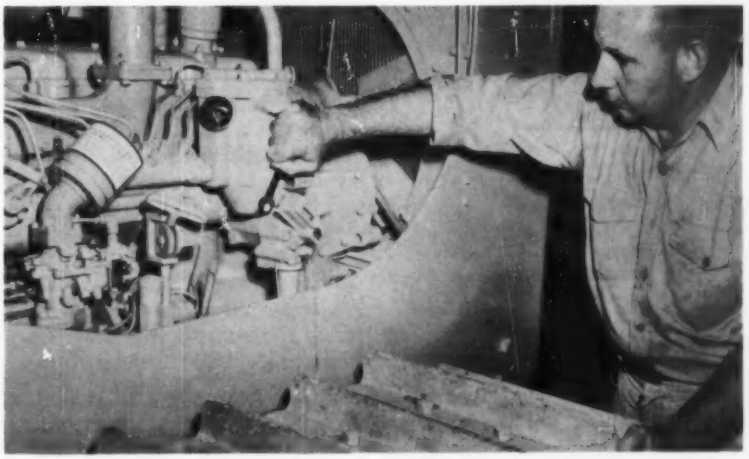
Frozen fuel lines need never stop a tractor, however. Simply filling the fuel tank at the end of each day's work drives out all moisture-laden air and almost entirely eliminates water from condensation. (Of course, there is always the possibility that the fuel contained moisture when purchased.)

In spite of faithful evening refueling, though, some moisture will get into the system. Since it is heavier than diesel fuel, it settles in two predictable places. Many tractors have drains in those two spots for removing water.

The first is at the base of the fuel tank. In warm weather, it is recommended that water be drained from the fuel tank before starting the engine in the morning. This procedure assures that only clean fuel will leave the tank that day. In freezing weather, however, an owner takes a chance on a possible freeze-up by waiting until morning to drain collected water from the fuel tank. Instead, he should drain it at the end of the day, after allowing the tractor to sit a while to give the water a chance to settle. During summer operation, water in the fuel tank should be drained every 125 service meter hours. To be safe in the winter, drain it every 50 hours. (These service periods



Moisture in your tractor's fuel system can collect in low spots and, when the weather turns cold, freeze. To prevent delay, drain water from fuel tank and from the fuel filter housing. Drain water at the end of working day, after letting tractor sit a while to give the water a chance to settle and collect.



assume the tank is being filled each evening.)

The second moisture drain on fuel systems is at the base of the fuel filter housing which contains a sump to trap any remaining moisture carried in the fuel. When the temperature is below freezing, trapped water in the filter housing should be drained each day before the operator goes home at night. Trapped air may have to be bled from the system after moisture is drained from the filter housing.

The pour point of the fuel being used also has to be considered during cold weather. To assure free fuel flow, use fuel with a pour point at least 10°F. lower than the lowest ambient temperature during working hours. Such "winter grade" fuels are available in most areas.

Don't wait for freezing weather, though, to change to winter grade fuel. Wax in "summer grade" fuel may start to gel at temperatures above freezing, partially plugging the fuel filters. Since wax content is the prime factor affecting the pour point, switching to low pour point fuel early in the season will reduce the danger of filters becoming clogged by wax during sub-zero weather.

Regardless of when you change to "winter grade" fuel, watch the pressure gage more closely than usual. It tells you when your filters are becoming clogged. And there's greater danger of clogging when the weather turns cold.

Pictures by courtesy of Caterpillar Tractor Co.

Dip-Coater Fires
(from page 31)

that a carbon dioxide system is an excellent solution for this particular hazard. Carbon dioxide is a powerful fire extinguishing agent, and also being an inert gas is not an electrical conductor and cannot damage production machinery or work-in-process. Finally, as it eventually is absorbed into the atmosphere following discharge, it leaves no mess to be cleaned up.

Pictures by courtesy of Walter Kidde & Co., Inc.

Resurfacing Materials
(from page 59)

fertilization, lawn grasses replace weeds and a pleasant, park-like setting may be maintained at reasonable cost.

In areas of railroad tracks and fence lines adjoining parking lots and storage yards, the use of a non-selective weed killer will eliminate the unsanitary, fire-hazardous, and insect-breeding area.

It is no longer necessary to have a crew pulling or digging weeds. The correct application of one of the new weed killers in granular, powder, or liquid form will do the job better, faster, and more economically.

From an address presented at the 12th Plant Maintenance & Engineering Show.

Fall Conference on Building Research

Seven timely topics, each of vital interest to the entire building industry complex, make up the program for the Building Research Institute's 1961 Fall Conferences, taking place this year at the Mayflower Hotel, Washington, D. C., Nov. 28 to 30.

Leading off the parade of sessions will be a day-and-a-half meeting on *Prefinishing of Exterior Components.* Chairman of this conference on prefinishing will be W. E. Kemp, Koppers Co., Inc.

Two and a half days of reports and discussion will be devoted to a subject that is at the top of every architect, builder and building owners interest—the *Performance of Plastics in Building.* Under the chairmanship of Donald R. Gray, The Dow Chemical Company, an array of speakers will present performance experience and data for evaluation and discussion by the conference-at-large.

Occupying a full day each will be two more programs packed with building industry interest: *Mechanical Fasteners for Wood,* and *Design for the Nuclear Age.* Presenting much-needed information on shear plates, mechanical fasteners for wood diaphragms, trussed rafters and glue-nailed construction, the former will be under the chairmanship of Jack Godley, Gregory Industries, Inc. Design for the Nuclear Age will deal with fall-out protection in various types of buildings, and will be staged under the chairmanship of Gifford H. Albright, Pennsylvania State University.

And, in an effort to achieve better communication about, as well as better description of colors, there will be an exploratory program on *Identification of Colors for Building,* featuring a trio of experts on various aspects of color design, and a panel discussion by architects, builders and others from the industry. Milo D. Folley, Sargent-Webster-Crenshaw & Folley, Architects, will be chairman of this session.

Another half-day session of keen interest to the owners and operators of commercial and industrial buildings, is the program on *Methods of Building Cost Analysis,* which will present methods used by some of the nation's top firms, under the chairmanship of Charles Bogert, Engineer, American Telephone and Telegraph Co.

And, rounding it all out, the BRI Research Committee will again present one of its increasingly popular roundups of widely varied aspects of building research. Here, conference attendants will hear reports on new research projects just getting under way, results of recently completed projects, and reports on research in other fields that has real importance for the building industry, but which otherwise might be completely overlooked in the flood of scientific information pouring out today.

Attendance is not limited to BRI members. Non-members wishing to participate may write for advance registration materials.

A unit of the Division of Engineering and Industrial Research of the National Academy of Sciences-National Research Council (2101 Constitution Ave., Washington, D. C.), the Building Research Institute holds two conferences per year, one in the spring and one in the fall, as part of its program to correlate and stimulate research that will improve tomorrow's buildings.

ACHIEVEMENTS AND AWARDS

The N. J. Department of Labor and Industry's Bureau of Engineering and Safety Award of Merit has been presented to the Federal Tool Engineering Co., Cedar Grove, N. J. Richard J. Sullivan, administrator of the Bureau, made the presentation to A. F. Pityo, president of the firm, and Erhardt Lindroth, safety foreman.

The company was cited for its safety record in accumulating a total of 600,000 man-hours of operation from June, 1959 to June, 1961, without a disabling injury among its 140 employees.

Federal Tool, which manufactures precision type welding equipment, is now eligible for the Commissioner of Labor and Industry's and Governor's Safety Awards in the State's Industrial Safety program, which is co-sponsored by the Department and the N. J. State Industrial Safety Committee.

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Aerojet-General Corporation's Liquid Rocket Plant Manufacturing Division recorded a notable achievement in safety recently by passing its 6 millionth consecutive man-hour without a disabling injury. The injury-free span for more than 1,500 employees goes over a period of two years.

R. J. Mill is Manager of the Manufacturing Division, assisted by W. J. Frank. W. E. Baily is in charge of the Liquid Rocket Plant Safety Department, and George J. Wolnez is the cognizant Area Safety Engineer. The six million hours is the finest safety record recorded by any Division at Aerojet, and one of the leading records in the entire nation.

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A National Safety Council 1961 Association Safety Award has been presented to the Gypsum Association, one of eleven associations representing various industries in the United States and Canada cited by the Council for significant achievement in their over-all safety programs and above average progress in accident prevention.

The Gypsum Association qualified for this award because its member companies had reduced their disabling injury frequency rate 12½ percent in the last five years. During the last twelve years even though the industry's man-hours of labor had doubled, injuries had been halved.

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Employees of the Pennsylvania Railroad are improving their safety record on the job for the third consecutive year, with a cut of more than 12 percent in the injury rate for the first half of this year compared with the same period in 1960, John T. Williams, manager of safety, announced recently. Figures are compiled monthly in the road's system-wide President's Safety Contest, covering all regions and departments. The upward trend in employee safety is accelerating this year on a month-to-month basis, Mr. Williams said. In comparison with the same periods in 1960, improvement in 1961 was 4.4 percent for the first quarter, 9.7 percent for the first four months, 12.3 percent for the first five months, and 12.5 percent for the half-year.

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Employees of Texas Butadiene & Chemical Corp.'s Lyondell Plant near Channelview, Texas, were "rewarded" for a three-year safety record by sharing in the company's $6300 rebate on Workmen's Compensation Insurance. On August 1 the plant completed a three-year period without loss of time due to accident, so management showed its appreciation of the personnel's safety awareness by dividing up the rebate 252 ways. Each employee received 25 silver dollars.

Plant officials say they know of no other firm which has turned an insurance rebate into "bonuses" for personnel.

The "reward" came as a surprise to the men and women who work at the Lyondell Plant. A week before the safety record was to become official, "Wanted" posters were hung at vantage points over the plant, proclaiming "Wanted . . . Safe T. Record . . . alias 3 years of operation without lost time due to accident . . . Reward . . . to be posted August 2." On August 1 a "Captured" banner was tacked across each poster, indicating that the three-year mark had been reached.

Employees did not know until the next morning what kind of "reward" they were to receive. At 6:30 a. m. a Western style armored car—a covered wagon pulled by a team of mules—pulled up to the plant. Plant guards, dressed in Western outfits, stood guard over the wagon and "deputized" each superintendent to turn over the money to his men. As each employee came off his shift during the day, he received his silver dollars in a pouch.

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The 1960 Secretary of the Navy Award for Achievement in Safety, presented to the Bureau of Supplies and Accounts for the 13th time in 14 years, was officially turned over to the Bureau's Industrial Relations Office, by the Chief of Bureau, RADM J. W. Crumpacker, SC, USN, to Mr. Walter J. Hurd, Bureau Director of Industrial Relations.

To win the safety award, the Bureau established a frequency rate of 1.91 accidents per million man hours of work, as compared to the all-Navy rate of 2.02. The Bureau's severity rate was 66, compared to the entire Navy's 260.

A total of 19 Bureau field installations also won individual activity awards in 1960. The tops-in-safety activities are:

The Naval Supply Centers at Bayonne, N. J. (9th time); Pearl Harbor, Hawaii (10th time); and

San Diego, California (8th time); the Naval Supply Depots at Guam, M. I. (6th time); Guantanamo Bay, Cuba (9th time); Mechanicsburg, Pa. (11th time); Newport, R. I. (7th time); Philadelphia, Pa. (11th time); Seattle, Wash., (1st time) and Yokosuka, Japan (6th time).

Also, the Naval Fuel Depot, San Pedro, California (2nd time); Naval Ordnance Supply Office, Mechanicsburg, Pa. (4th time); Military Industrial Supply Agency, Philadelphia, Pa. (4th time); Ships Parts Control Center, Mechanicsburg, Pa. (4th time); Navy Commissary Store, San Diego, Calif. (3rd time); Military Medical Supply Agency, Brooklyn, N. Y. (4th time); Navy Purchasing Office, Brooklyn, N. Y. (2nd time); Electronics Supply Office, Great Lakes, Ill. (2nd time) and the Aviation Supply Office, Philadelphia, Pa. (4th time).

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In the period June 1st to August 31st, the Canadian Industrial Safety Association presented the following "No Accident Awards":

Gold Seal Awards for one million or more injury free hours of operation: Canadian Arsenals Limited, St. Paul l'Ermite, Quebec; Dow Chemical of Canada, Limited, Sarnia, Ontario.

Silver Seal Awards for completing 365 days or more injury free operation, issued to 29 plants throughout Alberta and British Columbia.

The Canadian Industrial Safety Association's recognition of outstanding injury-free operation by any type of industry is the first of many services that this organization will ultimately provide.

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Two safety plaques for completing 1,000,866 man-hours without a disabling injury have been awarded The H. M. Harper Co., manufacturers of industrial fasteners and extruded shapes.

Separate awards were presented to the company's Machine Repair and Rebuilding Department by The Greater Chicago Safety Council and American Motorists Insurance Co., Chicago, at a special employee dinner held at the Morton Grove plant. R. E. Dalstrom, director of safety for the insurance company said that in his 35 years experience with AMICO, this is the first time that a maintenance department, regardless of company size, has received an award for more than one million safety hours.

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"Not only that, you will have that distinguished look too."

The Division Engineer's Award of the U. S. Army Corps of Engineers has been presented to the John Day Lock and Dam Residency Group on the basis of 1,364,936 manhours of work without a reportable accident during 1960. The award presentation was made to Resident Engineer H. B. Elder by Col. J. H. Beddow, Walla Walla District Engineer. Since the beginning of the construction of the John Day Dam in July 1958, over 3 million manhours of work have been accumulated with only seven disabling accidents.

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Safety awards highlighted the three-day annual session of the North Carolina Motor Carriers Association's Council of Safety & Personnel Supervisors. Thirty-one winners received awards presented by Col. Dave T. Lambert, Commander, State Highway Patrol, Raleigh, and L. F. Manneschmidt, Trailmobile, Inc., Atlanta, Ga.

The highest 1961 award, the State Truck Safety Trophy, went to Miller Motor Express, Inc. of Charlotte on the basis of overall safety on the highways, courtesy of drivers, personnel training, equipment and equipment maintenance, among other factors.

Carolina Freight Carriers Corp. of Cherryville, was first runner-up for the State trophy and Johnson Motor Lines, Inc., Charlotte, was second runner-up. Fredrickson Motor Express Corp., Charlotte, was the winner of the Over-the-Road (all divisions) plaque, and Southern Cleaners & Laundry, Inc., Jacksonville, N. C., won the Local (all divisions) plaque.

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The Stanley Works was the only company awarded a first-place plaque for the company's drivers 1960 driving record in the Class I Private Carrier Group, at the recent annual convention of the Motor Transport Association of Connecticut held at Groton.

The award was made for an average of 0.66 accidents per 100,000 miles. The next competing company had an average of 1.04 per 100,000 miles.

The average for the first eight months of this year for The Stanley Works is 0.00, or no accidents whatsoever. James M. Stuart, director of traffic for The Stanley Works, received the plaque from L. E. Craig, Jr., division manager of Trailmobile, Inc., Cincinnati, Ohio, truck manufacturer and sponsors of the award.

RIP SAW ACCIDENTS? ? ? . . . .
Now! Dangerous circular table saw injuries eliminated by new amazing visual Brett-Guard patented SEE-THRU safety tool! Fits all rip saws. Installs easily! Features TRANSPARENT PLEXIGLAS SHIELD. Covers saw blade yet allows FULL VISION & complete accuracy. Send for FREE FOLDER today!
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(For details, use Key # L-13 on card, page 9)

INSIDE THE TRADE

ANSUL CHEMICAL CO. has announced the following changes in its fire extinguisher division sales coverage: *David Francis,* Ansul salesman in the metropolitan New York area for the past 12 years, has been transferred to the Cleveland district.

Edward Bader, heretofore representing Ansul on national and governmental accounts, has been assigned to the New York area. He will continue to work on national accounts.

Burt Felldin, Philadelphia representative, will cover northern New Jersey in addition to the Philadelphia area.

THE FLINTKOTE CO. is starting construction of a $10 million asbestos-cement pipe plant in Ravenna, O. Signaling Flintkote's entry into this field, the plant is the first of two planned by the company as a result of a licensing agreement with Johns-Manville Corp. The asbestos-cement pipe products will be merchandised through its Orangeburg Mfg. Division.

Harvey C. Griffith Jr. has been appointed Manager-Sales Planning and Promotion for the Technical Products Operation of *GENERAL ELECTRIC'S Defense Electronics Division.* Griffith, who joined G-E 20 years ago, fills a new post in the expanding market development organization. His responsibility involves sales forecasts and sales program planning and promotion.

The *Technical Products Operation* has named *Edward R. Graves* Manager-Field Sales in its market development organization. He holds all field sales responsibility for industrial, commercial and military markets. Graves has been Philadelphia District Manager-Assemblies and Component Sales for General Electric since 1955.

The election of *Irving Mills* as a vice president of *CENCO INSTRUMENTS CORP.* has been announced by Ralph C. Read, Cenco president. Mills is also general manager of *Mills Hospital Supply Co.,* manufacturers and distributors of hospital and surgical supplies, which merged with Cenco in June.

A new line of personal protection equipment for welding and cutting is being marketed by the *National Cylinder Gas Division* of *CHEMETRON CORP.* which has become the only national distributor for the *Safety Products Division* of *AMERICAN OPTICAL CO.,* it was jointly announced. NCG dealers throughout the country will stock goggles, face shields, helmets, filter lenses, hats, caps, respirators and other protective equipment supplied exclusively by American Optical.

Philip F. Rose has been appointed Director of Sales for *CLARKSON LABORATORIES, INC.,* manufacturers of chemical compounds for airline, marine, industrial and institutional use. He was formerly General Sales Manager of the Penetone Co.

Joseph C. Carey has been appointed Sales Manager Chain Division of *THE McKAY COMPANY,* Pittsburgh, Pa., it was announced by James C. McKay, president. Mr. Carey succeeds *Rowland Erving* who has become director of the company's newly created Market Research Department. Mr. Carey has been assistant sales manager of the Division and prior to that was District Representative covering Western Pennsylvania and most of West Virginia from headquarters in Pittsburgh.

Wayne L. Dowdey, vice president-sales for *THE EIMCO CORP.* is now headquartered at the head office of the corporation in Salt Lake City, Utah.

Berne A. Schepman, vice president of the Process Engineers Division, has been moved from the divisional headquarters at San Mateo, California to the head offices in Salt Lake City.

THE HARLEY SOAP CO. of Philadelphia has appointed *Robert J. Bacon* to supervise their newly established New Products merchandising department. Mr. Bacon was formerly in the product merchandising department of Pioneer Industries.

John J. Beauvois has been appointed Assistant Manager of the International Division, *WALTER KIDDE & COMPANY, INC.* He comes to Kidde from McKinsey & Co., Inc., management consultants, where he specialized in international operations. Previously, he was associated with the International Division of Warner-Lambert Pharmaceutical Co.

In another appointment, *Robert W. Bowman* has been made Director of Product Planning for the Kidde Company. Mr. Bowman will be responsible for evaluation of new products as well as of the future of existing products of the Kidde Aero-Space Division, Industrial and Marine Division, Ultrasonic & Detection Alarms Division, International Division, and Kidde Electronics Laboratories. He joined Kidde in 1940 and most recently served as Chief Engineer of the Company's Industrial and Marine Division. He is Chairman of the Technical Committee of the Fire Equipment Manufacturers Association, and is also active on several committees in the National Fire Protection Association and the Compressed Gas Association.

The appointment of *Bertram M. Levison* as technical director of *FIDELITY CHEMICAL PRODUCTS CORP.* was announced by Maurice Bick, president of the chemical specialties firm. Mr. Levison, who joined the company 14 years ago as a staff chemist, will be responsible for the development of new products and will direct the company's research program in the field of electronic chemicals.

THE WESTINGHOUSE AIR BRAKE CO. has announced that its Le Roi Division operations in Cleveland will move to Sidney, Ohio, where they will be consolidated into the Division's Sidney plant. The move, which will be accomplished in several gradual steps, will be completed by Spring, 1962.

In January, 1960, Le Roi moved its manufacturing, sales, administration and engineering functions from West Allis, Wis., and Greenwich, Ohio, to Sidney. Simultaneously, machining operations for all its plants were transferred to Cleveland.

The formation of *ALLSTATE CHEMICAL CORP.* with central offices at 720 Grand Avenue, Ridgefield, N. J. has been announced for the manufacture of products for heavy duty surfacing of walls and floors. President of the new company is Thomas Jones, a veteran in the chemical business and formerly sales manager of Universal Chemical Corp. Edward Kubicky, one time head of the Industrial Division Laboratory of Devoe-Reynolds, is Vice President.

Cecil Miles has been appointed southwestern factory sales representative for *SELLSTROM MFG. CO.,* Palatine, Illi-

nois, manufacturers of face and eye protective equipment. Mr. Miles comes from a lengthy background of selling to distributing firms, the kind of work he will be doing for Sellstrom in addition to calling on key users of the firm's products. His territory will cover Texas, Louisiana, Arkansas, New Mexico and Oklahoma.

The appointment of *W. Glenn Oslin* as executive vice president and general manager of *SPEAKMAN COMPANY*, Wilmington, Del., is announced by Willard A. Speakman, Jr., president. Oslin has also been elected to the company's board of directors and to the board's executive committee. His appointment to the newly created post is a key move in a long-range growth program recently initiated by the 91-year-old manufacturer of showers, plumbing fixture fittings, and industrial safety equipment.

Before joining the company, Oslin was associated for five years with the Heater and Tank Div. of John Wood Co., Conshohocken, Pa., as vice president and general manager and earlier as general sales manager.

The appointment of *George E. Papp* to handle Acousti-Booth sales for the *BURGESS-MANNING CO., Architectural Products Division*, is announced by John E. Varlie, Sales Manager. Mr. Papp, a Kent State University graduate, has been vice president in charge of sales for Prutton Corporation, Cleveland, and has been a sales engineer and district manager for Johnson Wax Company in their Industrial Products Division.

Thirty-five janitorial and institutional supply houses have been named by the *ARMSTRONG CORK CO.* to distribute the Company's new line of commercial flooring maintenance products. The distributors include: *Sanitary Supply Co., Inc.*, Atlanta; *Central Chemical Co.*, Memphis; *Parwin Chemical Co., Inc.*, Texarkana, Tex.-Ark.; *Alamo Janitor Supply Co.*, San Antonio; *Southwest Sanitary Co.*, Dallas; *Austin Chemical Co.*, Austin; *Jim Turner Co.*, Houston; *Edmer Co.*, North Belmore, N. Y.; *Cortes-Ward Co., Inc.*, New York City; *The San-Aid Co.*, Long Island City; *Abbott Supply Co.*, Detroit; *The Mellocraft Co.*, Toledo; *P. B. Gast & Sons Co.*, Grand Rapids; *Kirchman Bros. Co.*, Bay City, Mich.; *Tri-County Welding Supplies*, Adrian, Mich.; *Braham Laboratories, Inc.*, Cleveland; *Braham Laboratories*, Pittsburgh; *G & L Supply Co.*, Mansfield, Ohio; *The Powell Co., Inc.*, Lima, Ohio; *The Rhiel Supply Co.*, Youngstown, Ohio; *Rose Chemical Products, Inc.*, Columbus, Ohio; *Cox Paper Co.*, Owensboro, Ky.; *Janitors Supply Co., Inc.*, Fort Wayne; *Louisville Paper & Mfg. Co., Inc.*, Louisville; *Normco Industries, Inc.*, Minneapolis; *Allied American Supply Corp.*, Philadelphia; *Atlee Products Co.*, Wilmington; *Independence Chemical Co.*, Gloucester City, N. J.; *Industrial Sanitation, Inc.*, Reading, Pa.; *District Supply, Inc.*, Washington, D. C.; *Empire Paper Co.*, Baltimore; *Firestone Paper & Supply Co.*, Lancaster, Pa.; *T. Frank McCall's Sons*, Chester, Pa.; *Weiss Bros. Equipment, Inc.*, Harrisburg, Pa., and the *Crown Supply Co.*, South Charleston, W. Va.

Arther R. Karstaedt, Jr., formerly of Madison, Wis., has recently moved to Reading, Pa., as Sales Promotion Manager for *WILLSON PRODUCTS*, a leading manufacturer of industrial safety equipment, and a Division of the *Electric Storage Battery Co.*

In his new responsibility, Mr. Karstaedt will develop and coordinate Willson national advertising and sales promotion program from the Reading headquarters in the Marketing Department under Sales Manager, William C. Weeks.

A graduate of the University of Wisconsin's School of Journalism, Mr. Karstaedt joined the *Ray-O-Vac Company* in Madison as Assistant to the Industrial Relations Manager in 1949. In 1953 he joined the company's Relations Department and in 1954 was made Customer Service Manager. Since June, 1960 Mr. Karstaedt has been responsible for Willson Products advertising and on November 1 of last year was given the additional responsibility for overall direction of Willson sales promotion. He also served as Chairman of the Willson Plan Board, a national distributor advisory council.

Jack Chaney has recently joined the Sales Staff of *Fibre-Metal Southeast, Inc.* of Decatur, Georgia. He attended Georgia Military College, has had previous experience in selling and has recently completed intensive sales training at *The FIBRE-METAL Products Co.* and *Glendale Optical Co.* Jack will call on and work with customers in Southern Alabama, Southern Georgia and Florida.

SAFETY PERSONNEL

A Charlotte trucking industry executive, *Jerry Reid*, was elected head of the Council of Safety & Personnel of the North Carolina Motor Carriers Association. Mr. Reid, Director of Insurance, Safety and Personnel of Central Motor Lines, Inc., received the chairman's gavel from retiring Chairman Harold Clark, Johnson Motor Lines, Inc., Charlotte.

A. H. "Fritz" Goelzenleuchter, a nine-year veteran in the field of industrial safety, has been named acting Works Safety Supervisor for Kaiser Aluminum & Chemical Corporation's Ravenswood Works. He succeeds *John Janous*, Safety Supervisor at Ravenswood since 1959, and one of seven professionals selected nationally this year to receive an Atomic Energy Fellowship in Industrial Hygiene.

On a year's leave of absence from the corporation, Janous will study at the University of Pittsburgh's Graduate School of Public Health under a program administered by the Oak Ridge Institute of Nuclear Studies. He will concentrate on the field of ergonomics (the development and application of scientifically derived working methods).

Goelzenleuchter, who assumes his new duties in September, joined Kaiser Aluminum in 1959 at Gramercy, La. He was named Assistant Safety Supervisor at Ravenswood in 1960. A graduate of the University of Houston with a B.S. in Mechanical Engineering, his experience encompasses some nine years of safety development and administration.

Jack L. King, Pot Operations Foreman, will replace Goelzenleuchter as acting Assistant Safety Supervisor.

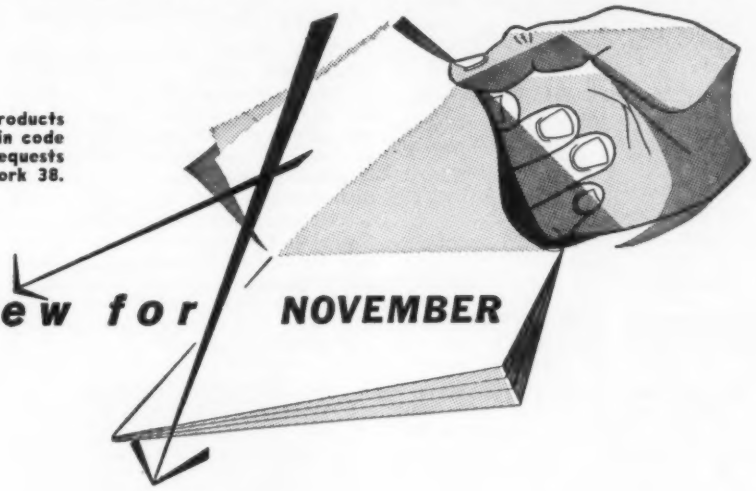
Glen Latshaw, a veteran of 19 years as safety supervisor for the Northwestern Bell Telephone Co. in Minnesota, has retired. One of the best known industrial safety experts, his program at Northwestern Bell achieved many notable records: three minor disabling injuries among 9,000 employees last year; no fatal traffic accidents among the company's 1,800 vehicles in its entire history. Mr. Latshaw, however, is not retiring from his numerous safety activities. He will continue as a board member of the Midwest Fleet Safety Supervisors Association, executive committee of the Minnesota Safety Council, general chairman of the Upper Midwest chapter of Veterans of Safety, and membership in the American Society of Safety Engineers and the Greater Minneapolis Occupational Safety Conferences.

The appointment of *Philip N. Bushnell* as director-personnel services of Universal Atlas Cement Division of U. S. Steel Corporation, has been announced by Charles B. Baker, Division president. He succeeds Gordon C. Huth, vice president-industrial relations, who is retiring after 46 years of service. A native of La Grange, Ill., Mr. Bushnell attended Beloit College, Wis., before becoming assistant to the managing director of the National Safety Council at Chicago in 1927. In the same city, he became safety engineer with the Portland Cement Association in 1933. He was named industrial relations director of the Missouri Portland Cement Co. at St. Louis in 1937 and joined Universal Atlas in 1943 as assistant manager of industrial relations. In 1955, he was appointed director of labor relations, in which capacity he continued to serve until his present advancement.

Mr. Bushnell is a member of the Industrial Relations Research Association, and past chairman and member of the Executive Committee of the Cement and Quarry Section of the National Safety Council.

Material appearing in this section is published as information and is not intended to imply endorsement or guarantee by this publication.

To obtain descriptive literature of products listed, use Reader's Inquiry Card. Write in code number given each item. Send written requests to: Service Dept., 75 Fulton St., New York 38.



what's new for NOVEMBER

AIRTIGHT HEADGEAR

(Use Key # 791 on Inquiry Card on page 19)

OF INTEREST to all gas-mask users industrial workers, firemen, policemen, emergency volunteers, is Willson Products newly patented Tite-Seal headgear. It makes any gas mask airtight in just four seconds. Two quick ratchet settings provide permanently adjusted fit. Headgear fits easily under fire helmets or safety hats. Adjusts comfortably to any head. Headgear, Bureau of Mines-approved with Willson Scottoramic facepiece, is lightweight, durable and easy to clean.

VISION TESTING SERVICE

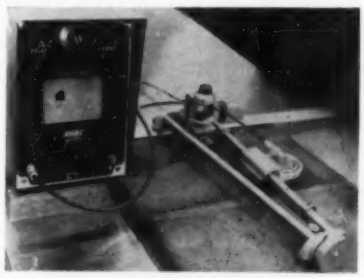
(Use Key # 792 on Inquiry Card on page 19)

AN EMPLOYEE vision screening service for plants of all sizes, locally or nationally, is being offered by Apex Visual Aid, Inc. to reduce the accident, waste and production losses caused by faulty vision. The service maintains mobile units staffed by expert technicians to test employees for visual acuity, depth perception, color discrimination, and effects of light and glare; to determine the individual's ability to see at specific distances; and to provide needed corrective and safety glasses. Card record is provided on each employee. The service specializes in the distribution and maintenance of safety glasses and goggles.

HIGH VISIBILITY CLOTHING AND WARNING FLAGS

(Use Key # 793 on Inquiry Card on page 19)

A COMPLETE line of high visibility, vinyl coated nylon, fluorescent danger flags, vests and sleeves is being offered by Charleston Rubber Co. Field testing of "Fire-Glo" products has proven conclusively their extra long durability and resistance to fading, according to the manufacturer. The vinyl coating is flexible and adheres tenaciously to the fabric. It is easily cleaned with a mild detergent solution. The flame-orange flags are available in several styles: plain, with standard lettering or with special lettering, with staff or without; also with diagonal reinforcing, with wooden rod sewn in top and with reinforcing wire and center loop at top. Also, the "Bulldog" Flag Clamp, with roughened neoprene coating on the jaws, is available with a "Fire-Glo" flag. Almost any size or style flag can be made to order.



WELDING ULTRASONIC SCANNING

(Use Key # 794 on Inquiry Card on page 19)

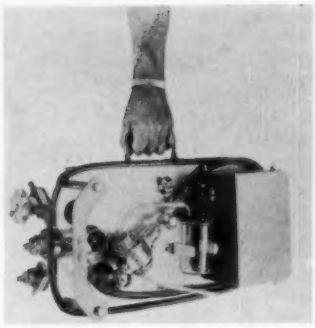
WELD inspection with ultrasonic test equipment is made possible with the Sonoray 5 made by Branson Instruments, Inc. for fast and reliable results. The Sonoray flaw detector sends bursts of sound into the welded plate, and picks up any returning echo. If the sound wave meets any obstacle, such as a slag inclusion, lack of fusion, or hairline crack, some of the energy will be reflected by this discontinuity, and will generate a vertical pip on the scope at the exact flaw location.

NEW FIBER GLASS HELMETS

(Use Key # 795 on Inquiry Card on page 19)

SEVERAL new fiber glass helmets have been added to the American Optical Company's Safety Products Division welding helmet line. Two types of wide-vision welding helmets, the popular curved-chin style and the straight bib type, are available with the 4½ by 5¼ inch wide vision lens cell. Also produced are a new narrow front shell which flanges at the top, bottom and sides (see picture), and a straight bib fiber glass. Both are available with a stationary or lift front plate holder.

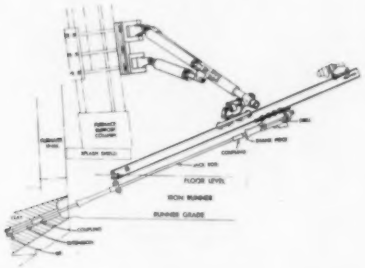
All the company's fiber glass helmets now feature a new friction joint which has nylon pressure plates and an improved tension spring. New positioning stop permits the helmet to be pre-set to any one of four working positions. A new-style, all-plastic headgear features an adjustable crown strap with a positive lock adjustment, a hinged rear head band permitting a better fit and self-locking rear size adjustment. All joints hinge on nylon bearings.



COMPACT RESUSCITATION KIT

(Use Key # 796 on Inquiry Card on page 19)

GLOBE Industries, Inc. has developed a new low-cost, lightweight, two-cylinder resuscitator kit known as the Compact II. Supplementing Globe's custom line of resuscitator equipment, the new kit includes the versatile Seeler resuscitator valve, an aspirator, two medical "D" cylinders and a metal box for containing and protecting the facepieces, airways and other items. All components are mounted on a single rigid plate, ready for instantaneous use. An ambulance model permits mounting on a hook in an emergency vehicle. Covered model is enclosed in a hard case or heavy-duty canvas bag. The convenient carrying handles and small size permit its use in areas of limited accessibility and through openings as small as 14 inches in diameter.



REMOTE CONTROL TAP DRILL

(Use Key # 797 on Inquiry Card on page 19)

INGERSOLL-RAND offers a new blast furnace tap drill, the Tapping Jack, consisting of an air-operated percussion drill on a flexible air-hydraulic mounting that permits one man to tap the furnace from a safely located control station. The hydraulically positioned drill boom accurately locates the tap hole and returns to the set drilling position for successive casts without further adjustment. Capable of drilling up to a 4½" hole through the new hardened tap hole mixes for fast metal flow. The manufacturer claims that the air and hydraulic system allows infinite control of feed and retraction motor speed, drill speed and blowing air for cooling of the drill bit. A high speed retraction motor withdraws the drill rod from the hole after the skull is penetrated. Air pressure is directed through the drilling rod during the drilling cycle to clean the hole of cuttings and also to keep the bit cool.

DOUBLE ICE MELTER

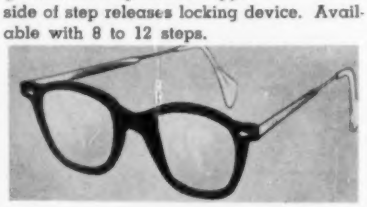
(Use Key # 798 on Inquiry Card on page 19)

A NEW chemical ice melter, reputed to be completely effective at all winter temperatures, is announced by Chem Industrial Co. "Melt" is said to work equally well at the water freezing point of 32°F or at temperatures as low as –40°F. It is composed of two different tyes of temperature-rated ice-melting chemicals. In the manufacturing process these are extruded together in flat segments, ranging from minute sizes to discs $\frac{1}{32}$ inches in diameter. Easily applied by hand sprinkling, shovel or mechanical or power spreader. Available in 10 and 25-lb. polyethylene bags and 100-lb. fiber drums.

SAFETY LADDER GETS CLOSE TO WORK

(Use Key # 799 on Inquiry Card on page 19)

A NEW safety ladder with a caster mounted base that can roll under desks, office equipment and machinery has been announced by The Ballymore Co. Designated the Model "K", it is of cantilever construction which provides an overhang without sacrifice of support. This new design allows the upper portion of the ladder to clear obstacles normally found in offices and factories, without having to move furniture, machinery, etc. The model "K" features all-welded steel construction with smudge-proof synthetic aluminum finish for maximum durability. For stability and safety, the user's weight applied to the first step retracts the front casters and places rubber-tipped anchor legs on the ground. Toe pressure applied to underside of step releases locking device. Available with 8 to 12 steps.



VERSATILE SAFETY GLASSES

(Use Key # 800 on Inquiry Card on page 19)

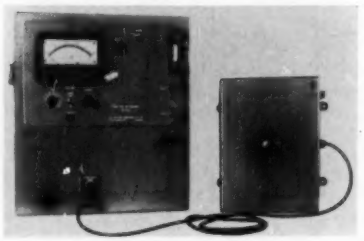
NEW Polyfit safety glasses are designed to conform to the nose and face contours of 90% of all workers. Key feature to the adaptability is an extra thick nose bridge. Available in two sizes—46 x 39mm and 48 x 41mm. Plastic frames can be had in flesh, green or new mahogany. Temples are Rhodium-plated for greater resistance to corrosion. Choice of vinyl-coated cable or spatula ends. Welded hinges with Sur-Loc pins hold temples securely to the frame. F-7 Shape 6.00C Super Safety Lenses—in clear or anti-glare glass or plastic. Made by Chicago Eye Shield Co.

CARBON MONOXIDE ANALYZER

(Use Key # 801 on Inquiry Card on page 19)

THE GELMAN Infrared Carbon Monoxide Analyzer incorporates many new design features which increase the accuracy and reliability of the method. It gives accurate results in only a few seconds. As a continuous analyzer it can be used to check the gases in heat treating operation, to monitor air pollution, to monitor automobile exhausts in tunnels and garages, as a safety device in chemical plants. The standard instrument has switch-selected ranges of 0 to 0.05% and 0.03 to 0.25%. The mixture of gases to be analyzed is passed through a sampling tube and a reference tube and are placed side by side between an infrared radiating filament and an infrared detector. The radiation through these two tubes is detected and compared. The difference is then displayed on a scale reading directly in percent of carbon monoxide.

The analyzer can be used for sampling from compressed gas lines or from open



air. It is available with an integral sampling pump, flowmeter, and pressure regulator. A jack is provided for connection to a standard strip chart recorder. Compact unit measure 18 x 19 x 10" and weighs 60 lbs.

ELECTRONIC INTRUSION ALARM

(Use Key # 802 on Inquiry Card on page 19)

THE NEW Crown Defender creates an invisible electronic shield around unattended objects, rooms or entire buildings to protect them from burglary and intrusion. Upon detecting a threat of intrusion, the unit will activate an audible alarm, turn on floodlights, take moving pictures of the burglary, or notify the police by telephone recording.

The electronic activator unit, which applies the principles used in proximity fuses

in artillery shells and bombs, automatically compensates for atmospheric changes in pressure, temperature and humidity, and for gradual physical changes in the area it is guarding. This new product can be rented or purchased, with accessories, from Crown Electronics Co.

BUILDING STONE CLEANER

(Use Key # 803 on Inquiry Card on page 19)

A NEW, EASY-TO-USE commercial chemical formulation that replaces sandblasting, acids, and grinding for removing accumulated dirt and grime from exterior and interior areas of sandstone, limestone, rough marble, and natural color concrete is announced by K & E Chemical Co. Named Klenztone No. 1, it contains no harsh acids, bleaches, alkali detergents, or abrasives; will not damage clothing or wood. Consisting principally of salts in solution, it will not erode or pit the surface, loosen the mortar, or discolor the stone. It is said to harden stone surfaces to make them more self-cleansing. Tested by an agency of the U. S. Government, it has been recommended as cleaner for stone and rough concrete surfaces for use by government personnel. Available in quart, gallon and 5-gallon containers.

WINDSHIELD DE-ICER

(Use Key # 804 on Inquiry Card on page 19)

A NEW spray for melting ice and snow on car windows is announced by Speco, Inc. Called Ice Rem Windshield De-Icer, it quickly thaws ice at temperatures as low as -20°F. It can also be used for freeing frozen car door and trunk locks, doors and windows. Home applications include loosening frozen storm doors, melting ice on thresholds, removing frost and ice from windows, etc. Available in 16 ounce spray cans.

FLUORESCENT YELLOW PAINT

(Use Key # 805 on Inquiry Card on page 19)

LAWTER Chemicals, Inc., has developed a new color, "Traffic Yellow," for its line of HI-VIZ Industrial Safety Paint. The color has wide application for many municipal and industrial uses. Its high visibility recommends its use on traffic control signs and devices, highway stripings, barricades, signal paddles and flags, radiation protection shelters, tollway and expressway markers, etc. The new yellow and eight other colors maintain their color for periods up to 21 months or more, depending on method of application and geographical location. The paints may be applied by brush, roller or spray equipment and also are available in aerosol containers.

WELDER'S ENVIRONMENTAL HELMET

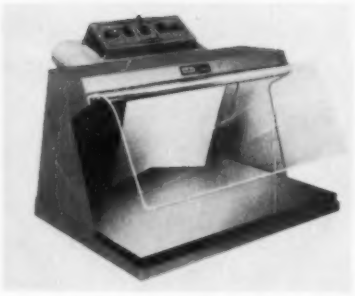
(Use Key # 806 on Inquiry Card on page 19)

DEVELOPMENT of an entirely new health protective system for welders has been announced by Jamieson Laboratories. The Whitecap model WL-1, provides complete above-the-shoulders protection for the wearer, including the head, eyes, ears, nose, throat, face, neck and entire respiratory system. Air is supplied through the centrifugal filter/blower (for filtered air) or a special hose adapter connecting the system to in-plant compressed air. A high efficiency extra fine particle filter removes toxic fumes such as beryllium, cadmium, lead and zinc, as well as all flux fumes. A chemical filter is available for providing ozone protection. The lightweight helmet is double-shell fiberglass. Inlet air is ducted between the two shells and through peripheral holes in the inner shell. The removable welder's lens can be raised and lowered easily. A spark-resistant shroud affords further protection for the lower face and neck. Chin cup and head bands are adjustable for individual fit. A quick disconnect feature, whereby a sudden tug in any direction will cause the hose and helmet to disconnect, completely frees the wearer.

DUST-FREE WORK STATION

(Use Key # 807 on Inquiry Card on page 19)

THE NEW Dust-Kleer Work Station, made by Craftools, Inc., was designed for use in instrument plants and laboratories where controls, transistors, miniature electronic parts and other minute assemblies are manufactured and assembled, and where a dust-and-fume free atmosphere must be maintained. The unit is a self contained, dust free work station that has an internal silent exhaust system that picks up any dust and fumes at the point of work. A replaceable filter traps the particles, exhausting fresh clear air. No external duct is required. Features: twin lights to illuminate the work area; a hinged plexiglass eyeshield for both safety and vision; individual heavy duty switches for the control of the system and lights, plus two 110V outlets for soldering irons, hand grinders, etc.; a pilot light and circuit breaker in the control panel. Various work surfaces (Formica, Plastic or Transite) can be supplied with the unit depending on the type of work and assembly to be done. Accessory bracket for magnifiers, work holders and other attachments is available. Unit measures 24½" x 18½" x 19".



LINEMEN'S GLOVES & SLEEVES

(Use Key # 808 on Inquiry Card on page 19)

THE MAN who climbs a pole to handle hot lines isn't dressed for safety unless he is wearing special rubber gloves and sleeves. Lineman gloves—worn by utility linemen and others working with high voltage equipment—are made of 25 to 32 layers of natural milled rubber. Their manufacture is strictly supervised, for the slightest defect could cause electrical seepage and injury or loss of life to the wearer. A particle of dust nesting between layers of rubber causes a defect. For this reason the Surety Rubber Co. is now producing its linemen's glove in a building where air-borne dirt is eliminated by an electrostatic system of filtering the air. The gloves, upper left, are a Surety Straight Cuff style. Lower left are sleeves which fit up to the shoulder. Right are Turn-Cuff Linemen's gloves which, when turned, reduce creepage—an important point in wet or humid weather.

HAND PROTECTION FROM GLUE

(Use Key # 809 on Inquiry Card on page 19)

PROTECTION against skin irritation and sensitization from glues used in making furniture, cabinets, plywood-paneling, table tops, etc., is afforded by Kerodex,® a protective barrier cream. For work with water-soluble glues, a thin coating of Kerodex-71 for wet work is applied to the hands. For work with plastic adhesives and other non-water soluble joining compounds, Kerodex-51 for dry work is used. When both water-soluble and water-unsoluble glues are being worked with, both creams are applied. This barrier cream, made by Ayerst Laboratories, is greaseless, stainless and will not affect materials handled.

"WHITE ROOM" CLOTHING CLEANER

(Use Key # 810 on Inquiry Card on page 19)

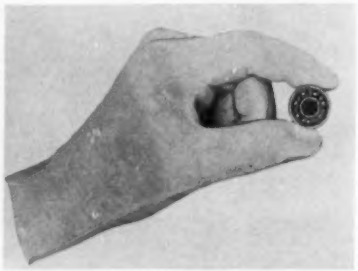
HOFFMAN INTERNATIONAL announces the introduction of systems designed for total cleaning of "Superclean Room" clothing and accessories. "Superclean" or "white" rooms are environmentally controlled work areas in which highly sensitive instruments and sophisticated systems are manufactured, packaged or processed. Microscopic examination of "superclean room" garments has shown that conventional dry cleaning and laundry equipment is inadequate to meet rigid standards of cleanliness.

The Hoffman Master Jet dry cleaning machine provides continuous filtration of cleaning solvents during the cleansing operation and absolute filtered air during the drying cycle so that all uniforms, laboratory coats and accessories are completely free of lint and other microscopic contaminants.

EMERGENCY LIGHTING SYSTEMS

(Use Key # 811 on Inquiry Card on page 19)

INSTANTANEOUS and automatic operation, electrical supervision and automatic recovery are features of two new 32-volt emergency lighting systems introduced by The Standard Electric Time Co. Should normal lighting fail, emergency system goes into operation and also has built-in "supervisory" circuits which report any disarrangement in the system—even to a burned-out bulb in an exit sign. Power is provided by Flexlab Nickel-Cadmium batteries which maintain a useful life of 25 years or more, are non-acid, and therefore do not corrode terminals or hardware. Addition of water once a year is the only maintenance and the Polystyrene cell cases permit viewing water level. Recharging is automatic.



IMPREGNATED NYLON GLOVE

(Use Key # 812 on Inquiry Card on page 19)

AN especially impregnated glove for delicate handling operations has been developed by the Standard Glove Co. of New Jersey. Designed to the needs of inspection, assembling and testing in the metal working industries, this new work glove is made from 100% nylon and is lint-free. The glove fabric is impregnated with a new chemical formulation which prevents transference of perspiration through the glove onto the work objects. Available in small, medium and large sizes in both men's and ladies styles. For color coding, they are available in pink, blue and white.

NEW DUST COLLECTOR

(Use Key # 813 on Inquiry Card on page 19)

VACCULATOR Co., Inc. offers a line of cabinet-type Dust Collectors for which a high efficiency is claimed. Three models, designated F.G.M. 5, 10, and 15 are powered with ½, 1, and 1½ H.P. motors respectively, affording approximately 400, 600, and 900 C.F.M. capacities. Each unit has two electrostatic filters placed in series. All models are mounted on rubber supports, are portable, completly fireproof, and are equipped with aluminum alloy impellers for spark-resistance. They also have exhaust silencers.

FLOOR SQUEEGEE ATTACHMENT

(Use Key # 814 on Inquiry Card on page 19)

A SQUEEGEE pick-up attachment for wet-dry vacuum cleaners has been introduced by Clarke Floor Machine Co., Division of Studebaker-Packard Corp. Designed to be easily installed without special tools on Clarke Models 610 and 620 Wet-Dry Vacuum Cleaners, it has a 28" squeegee width for fast pickup of all types of liquid. The attachment is equipped with a flexible hose which carries liquids from squeegee to tank. The unit is mounted on the vacuum cleaner by sturdy steel brackets. A lever on the vacuum cleaner handle bar easily raises and lowers the squeegee.

TOILET CONDITIONER

(Use Key # 815 on Inquiry Card on page 19)

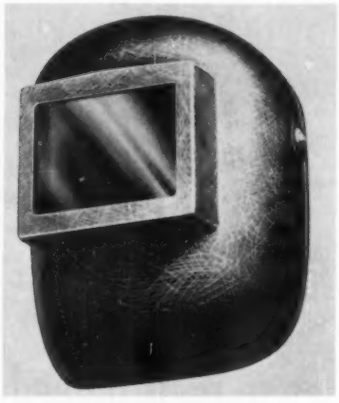
"SANI-BLU" automatically cleanses, deodorizes, sanitizes. Easily attached inside the tank, the plastic unit contains a water soluble solid and automatically releases a measured amount with each flushing. Mildly fragrant the formula speeds scrubbing and eliminates hard water stains. A single unit lasts up to 1,000 flushings, refills available sealed in individual plastic bags. Made by Ramrod Products, Inc.

RESCUE BREATHING DEVICE

(Use Key # 816 on Inquiry Card on page 19)

A NEW compact, lightweight adjunct for mouth-to-mouth resuscitation, called the MSco Rescue Breather, is announced by Medical Supply Co. Small enough to be carried in the rescuer's pocket, purse, auto compartment, or first aid kit, the unit features a flexible, tightly fitting facepiece that fits all faces and configurations, child or adult.

As reported by the maker, it is simple to use and, extending only one inch into the victim's mouth, cannot stimulate the gag reflex. Its specially designed bit block can be wedged between the victim's teeth to open the mouth in case of a jaw spasm. There are no valves or moving parts and the equipment is easily cleaned and sterilized.



WIDE-VISION SAFETY MASK

(Use Key # 817 on Inquiry Card on page 19)

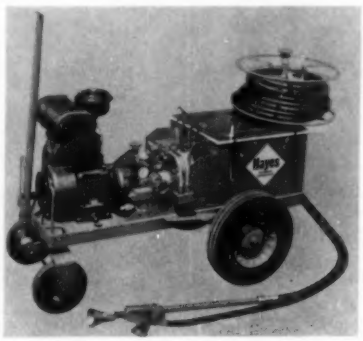
A NEW Fiberglas wide-vision Safety Mask has been developed by The Fibre-Metal Products Co. Designated No. 880, the new mask is light in weight (22 ozs. complete with lens), uses lens size 4½" x 5¼" for maximum vision, and is available at low cost. The No. 880, recommended where increased vision is desired for welding and for heavy impact face protection, can be used with conventional headgear or in conjunction with a safety cap. Standard features: a new plastic headgear, ratchet headsize adjustment, overhead depth adjustment, free float suspension joint arms and all aluminum parts for light weight and resistance to corrosion. Friction joints provide adjustment for lowering and raising of the mask as desired.

POWER MAINTENANCE SPRAYER

(Use Key # 818 on Inquiry Card on page 19)

HAYES Spray Gun Co. has announced a new portable and compact, all-purpose heavy-duty power sprayer, The Hayes Jet 500. Based on a new principle, it is designed for a broad range of spray applications, using any type of chemical, detergents, cleaning compounds or sanitizing chemicals—liquid or soluble—with cold water. No hot water, steam or high-pressure air are needed. It draws water as needed from a faucet, tank or other external water source. No chemical ever passes through the water pump. As water is discharged from the pump, a vacuum siphons chemical from the concentrate tank. Water and chemical are automatically mixed.

Spray also applies all types of insecticides, fungicides, weedkillers, fertilizers,

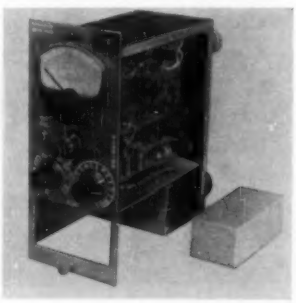


bactericides and germicides. Its one model has a 7 H.P. heavy duty gasoline engine, 4 piston pump, stainless steel parts wherever chemical comes in contact. Fifty feet of heavy duty, dual hose, carried on a reel, supplied with sprayer.

VIBRATION MONITOR

(Use Key # 819 on Inquiry Card on page 19)

A TRANSISTORIZED monitor to detect and measure vibration amplitudes over a wide frequency range, in any type of machinery and equipment, has been developed by Lehigh Valley Electronics, Inc. The new Vibration Monitor is completely transistorized, modular in construction, and portable. It is adaptable to 110v or battery power. High pass or band filters are available to suit users application. It has a frequency range of 10 to 1,000 cps and displacement range of 1.5, 5 and 15 mils.



STATIC ELECTRICITY METER

(Use Key # 820 on Inquiry Card on page 19)

A NEW electronic instrument for use in detecting the static charge differential that exists between improperly grounded or bonded objects is being produced by B. K. Sweeney Mfg. Co. Designed primarily as a safety device for use where flammable

liquids are handled and stored, such as in aircraft, missile, and vehicle fueling areas, the Model SWE-1125 Static Meter features a green-red, "go, no-go" dial face that tells at a glance whether or not the grounding or bonding connections in an area are good. Device also has applications in the textile, paper-making and other industries where static charge detection is a critical factor. Battery-powered instrument is voltage-operated and reads electrostatic charge—not resistance. Energy as low as one millimicro joule from the measured source will actuate the indicator. The meter indicates whether the charge is negactive or positive. Quantitative measurements of static charges can be easily made with a companion instrument made by the company.

CLEANER & ANTI-FOGGING LIQUID

(Use Key # 821 on Inquiry Card on page 19)

A NEW cleaner and anti-fogging liquid called Clear-Sight, specially formulated for safety glasses, plastic face shields, plastic goggles, is being made by Disco. The special emulsion will not scratch or mar plastic of any type making it especially desirable for plastic safety equipment. Available in 1 pint glass bottles for use at goggle cleaning stations and also available in new 2-ounce plastic squeeze-bottle for individual or small group use. After application, lens is polished lightly with heavy-duty paper or a soft dry cloth.

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, Etc., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, AND AS AMENDED, OF SAFETY MAINTENANCE, published monthly at Rensselaer, N. Y., for October 1, 1961.

State of New York, County of New York, ss. Before me, a Notary Public in and for the State and County aforesaid, personally appeared Arthur Snyder, who, having been duly sworn according to law, deposes and says that he is the business manager of SAFETY MAINTENANCE, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management and circulation of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in Section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editors and business manager, respectively, are: Publisher, Alfred M. Best Company, Inc., Executive Offices, 75 Fulton Street, New York, N. Y.; Managing Editor, C. M. Kellogg; Editor, Harry Armand; Business Manager, Arthur Snyder; all of 75 Fulton Street, New York, N. Y.

2. The owner is Alfred M. Best Company, Inc., 75 Fulton Street, New York, N. Y.; and the owners of 1% or more of the stock are: Gertrude V. Ammermuller, 235 West 102nd Street, New York, N. Y.; Mildred B. Baird, 28 Prospect Ave., Montclair, N. J.; Voting Trustees under the Will of Alfred M. Best, 75 Fulton St., New York, N. Y.; Lillian E. Floegel, 111 Stratford Ave., Garden City, N. Y.; Kellogg & Company, % Nat'l State Bank, Summit, N. J.; Alice L. Kellogg, 615 Tremont Avenue, Westfield, N. J.; Chester M. Kellogg, 615 Tremont Avenue, Westfield, N. J.; Wilhelmina J. Kellogg, 603 Tremont Ave., Westfield, N. J.; John R. McElraevy, 394 Porter St., Manchaster, Conn.; Raymond T. Smith, 10 South LaSalle St., Chicago, Ill.; Arthur Snyder, 75 Fulton St., New York, N. Y.; Kathryn Snyder, Garden City, N. Y.

3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages or other securities are: None.

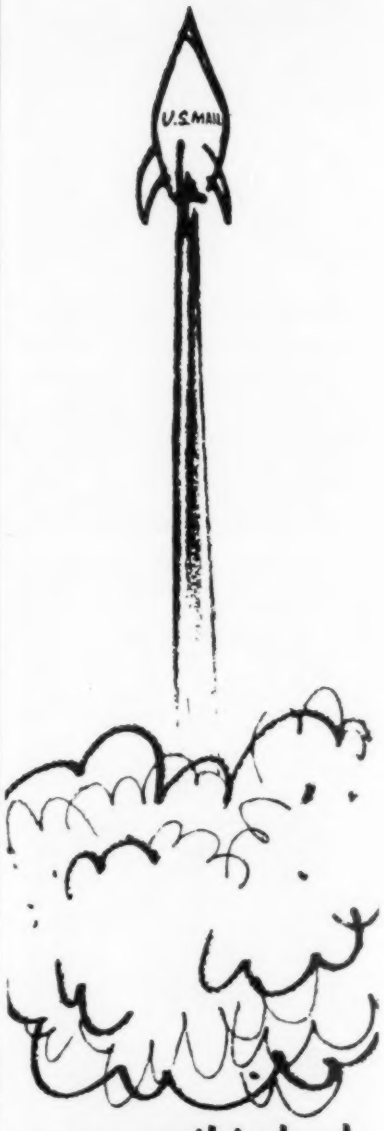
4. That the two paragraphs next above giving the names of the owners, stockholders and securities holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees hold stock and securities in a capacity other than that of a bona fide ownership; and this affiant has no reason to believe that any other person, association or corporation has any interest, direct or indirect in the said stock, bonds or other securities than as so stated by him.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: 13,400.

ARTHUR SNYDER,
Business Manager.

Sworn to and subscribed before me this 28th day of September, 1961.

DONALD F. AYERS
NOTARY PUBLIC, State of New York
No. 30-5133375
Qualified in Nassau County
Commission Expires March 30, 1962

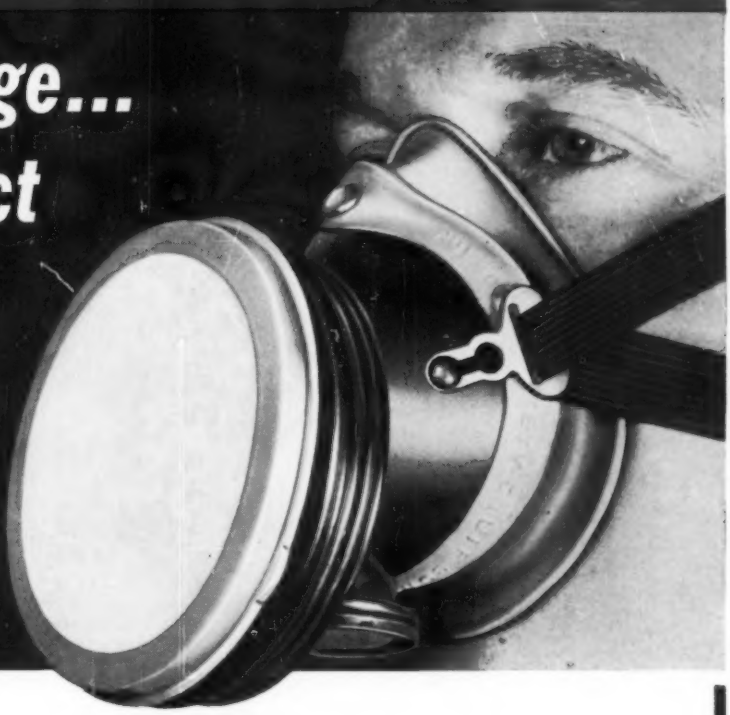


zone mail indeed results in speed

The Post Office has divided 106 cities into postal delivery zones to speed mail delivery. Be sure to include zone number when writing to these cities; be sure to include *your* zone number in *your* return address — after the city, before the state.

New PAINT SPRAY RESPIRATOR C-251

BY PULMOSAN



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Now you can have positive protection against all paint sprays and vapors... lead-based, enamels and lacquers... with single-cartridge comfort. Approved by the U. S. Bureau of Mines, the new C-251 Paint Spray Respirator joins the Pulmosan *interchangeable* C-200 respirator series, with its many exclusive advantages:

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- *Independently replaceable pre-filter and cartridge*
- *Paint spray cartridge interchangeable with other C-200 filter units*

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(For details, use Key # L-14 on inquiry card on page 19)

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(For details, use Key # L-15 on inquiry card on page 19)

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